	5 year goals					
	2016-2017	1	2	3	4	5
SPG	66	70	75	75	77	80
RDG	63	70	73	77	79	80
MATH	63	68	71	73	75	79
Growth	2.08	+4	+4	+3.5	+3.5	+3.5

777	Forsyth County Schools	340314	Bolton Elementary	Piedmont Triad	PK-05	Y	D	45	D	42	D	44	Met	0.34	18	
785	Forsyth County Schools	340348	Clemmons Elementary	Piedmont Triad	PK-05		B	84	B	81	B	84	Exceeded	2.91	13	
786	Forsyth County Schools	340350	Clemmons Middle School	Piedmont Triad	06-08		C	61	C	61	D	49	Met	-0.35	32	
793	Forsyth County Schools	340372	Flat Rock Middle	Piedmont Triad	06-08	Y	D	48	D	44	D	44	Exceeded	6.09	22	
808	Forsyth County Schools	340426	Kimmel Farm Elementary	Piedmont Triad	PK-05	Y	D	54	D	51	D	53	NotMet	-3.1	20	
812	Forsyth County Schools	340432	Lewisville Elementary	Piedmont Triad	PK-05		A+NG	89	A	86	A	87	Exceeded	7.92	13	
815	Forsyth County Schools	340442	Meadowlark Middle	Piedmont Triad	06-08		B	81	B	78	B	75	Exceeded	3.51	28	
822	Forsyth County Schools	340457	Frank Morgan Elementary	Piedmont Triad	PK-05		B	76	B	71	B	76	Exceeded	2.24	21	
841	Forsyth County Schools	340520	South Fork Elementary	Piedmont Triad	PK-05	Y	D	50	D	45	D	49	Exceeded	3.87	19	
842	Forsyth County Schools	340528	Southwest Elementary	Piedmont Triad	PK-05		B	79	B	79	B	78	Met	-1.81	18	
850	Forsyth County Schools	340548	Ward Elementary	Piedmont Triad	PK-05	Y	C	57	D	54	C	56	Met	1.29	21	

Demographic Profile	0 - 5 mi		0-15 min		Charlotte, NC DMA	
	Count	%	Count	%	Count	%
DEMOGRAPHIC SNAPSHOT						
Daytime Population	30,327		85,613		1,496,641	
2017 Population Estimate	85,814		122,703		3,227,455	
2022 Population Projection	101,246		144,255		3,402,282	
Avg. Ann. Pop. Growth % (2010-2017)	4.89%		4.89%		1.52%	
Family Size						
2017 Estimated Size	2.7		2.6		2.5	
2022 Projection Size	2.7		2.6		2.5	
2027 Forecast Size	2.7		2.6		2.5	
Average HH Income	$ 100,606		$ 92,379		$ 73,002	
POPULATION BY AGE						
Age 0 to 4	5,864	6.8%	8,806	7.2%	207,524	6.4%
Age 5 to 14	11,327	13.2%	16,088	13.1%	377,442	11.7%
Age 14 to 18	5,432	6.3%	7,409	6.0%	177,488	5.5%
Age 18 to 22	5,037	5.9%	6,890	5.6%	206,628	6.4%
Age 22 to 25	2,407	2.8%	3,657	3.0%	119,256	3.7%
Age 25 to 30	3,670	4.3%	5,865	4.8%	189,745	5.9%
Age 30 to 35	4,372	5.1%	7,254	5.9%	193,243	6.0%
Age 35 to 40	6,017	7.0%	9,104	7.4%	204,673	6.3%
Age 40 to 45	7,371	8.6%	10,416	8.5%	222,017	6.9%
Age 45 to 50	7,345	8.6%	10,171	8.3%	230,999	7.2%
Age 50 to 55	6,687	7.8%	9,207	7.5%	231,265	7.2%
Age 55 to 60	5,736	6.7%	7,929	6.5%	216,875	6.7%

Executive Summary

Building on the priority to support science, technology, engineering, and mathematics (STEM1) education set by the Obama Administration that is reflected in several of the Administration's initiatives,2 the U.S. Department of Education (the Department) is releasing a report outlining a vision to carry on that legacy in the coming decade. This vision was informed by the key obser- vations, considerations, and recommendations put forth by a varying range of STEM education thought leaders and experts from the field during a series of 1.5-day workshops convened by the Department in collaboration with American Institutes for Research (AIR). This report is a resource that provides examples, not endorsements, of resources that may be helpful in reaching the STEM 2026 vision as outlined by the field experts.

The complexities of today's world require all people to be equipped with a new set of core knowledge and skills to solve difficult problems, gather and evaluate evidence, and make sense of information they receive from varied print and, increasingly, digital media. The learning and doing of STEM helps develop these skills and prepare students for a workforce where success results not just from what one knows, but what one is able to do with that knowledge.3 Thus, a strong STEM education is becoming increasingly recognized as a key driver of opportunity, and data show the need for STEM knowledge and skills will grow and continue into the future. Those graduates who have practical and relevant STEM precepts embedded into their educational experiences will be in high demand in all job sectors. It is estimated that in the next five years, major American companies will need to add nearly 1.6 million STEM-skilled employees (Business Roundtable & Change the Equation, 2014). Labor market data also show that the set of core cognitive knowledge, skills, and abilities that are associated with a STEM education are now in demand not only in traditional STEM occupations, but in nearly all job sectors and types of positions (Carnevale, Smith, & Melton, 2011; Rothwell, 2013).

The nation has persistent inequities in access, participation, and success in STEM subjects that exist along racial, socioeconomic, gender, and geographic lines, as well as among students with disabilities. STEM education disparities threaten the nation's ability to close education and poverty gaps, meet the demands of a technology-driven economy, ensure national security, and maintain preeminence in scientific research and technological innovation.

In recognition of the widening skills and opportunity gaps in STEM, the Obama Administration has initiated several efforts to motivate action. In 2010, President Obama announced the launch of Change the Equation, a CEO-led effort to improve STEM education, as part of the Administration's larger Educate to Innovate campaign. In addition, under this Administration, the Committee on STEM Education (CoSTEM), comprised of several federal agencies—including all mission-science agencies and the Department—is facilitating a cohesive national strategy to increase the impact of federal investments in STEM teaching and learning. In 2013, CoSTEM put out a Five-Year Federal Science Technology, Engineering, and Mathematics Education Strategic Plan. In January 2016, Obama announced a bold Computer Science for All initiative; and the Elementary and Secondary Education Act (ESEA), as reauthorized under the Every Student Succeeds Act (ESSA) in December 2015, identifies all four STEM disciplines, including engineering and computer science, as funda- mental components of a well-rounded education for all children. ESSA also includes provisions to promote local innovation and investments in what works to improve STEM teaching and learning.4 These are just a few examples of the focused attention being placed on STEM at the national level to generate change and improvement at the state and local levels.

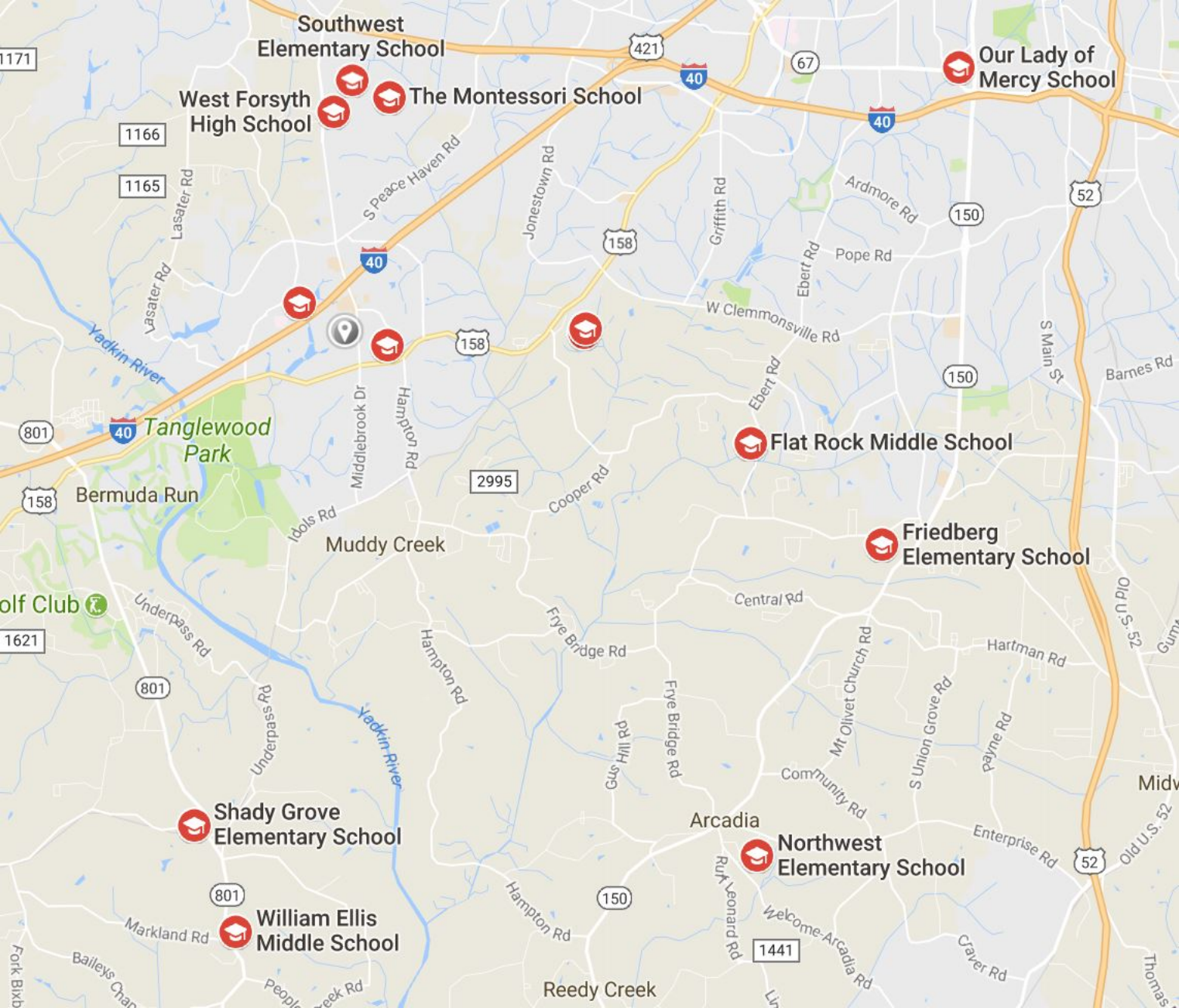
This report is a complementary effort, resulting from a Department-led effort to gain insight into the latest research and thinking about how to improve STEM teaching and learning, including how to ensure the engagement and success of the full diversity of the nation's learners. In 2015, the

Department, in collaboration with AIR, invited nearly 30 experts and thought leaders in STEM teaching and learning to participate in a series of discussion-based workshops to exchange ideas and develop recommendations for the future of STEM education. The project contributors were asked to draw from their own experiences, and their knowledge of the evidence behind examples of innovative and promising new approaches taking hold in communities across the nation.

This report summarizes the results of these workshop discussions and outlines what emerged from the experts' recommendations; namely, an aspirational vision (hereafter referred to as "STEM 2026") for STEM education to promote lifelong learning among all youth and in all communities. In recognition of the challenges to transforming STEM education on a large scale, the STEM 2026 vision presented in this report is meant only as starting point upon which key stakeholder groups, including policymakers, researchers, educators, and industry leaders, as well as the broader public, can build. The goal of this vision is not to establish a prescribed set of activities but to motivate actions, including the development of communities of practice (CoP), that help build a stronger evidence base for what STEM teaching and learning experiences work best in particular contexts and to serve diverse learners.

U.S. Dpartment of Education (the Department)
John B. King, Jr., Ed.D. Secretary
Office of Innovation and Improvement
Russell Shilling, Ph.D. Executive Director of STEM
September 2016
provided.

This report is available on the Department's


Southwest Elementary School
West Forsyth High School
The Montessori School
Our Lady of Mercy School
Flat Rock Middle School
Friedberg Elementary School
Tanglewood Park
Bermuda Run
Muddy Creek
Shady Grove Elementary School
William Ellis Middle School
Arcadia
Northwest Elementary School
Reedy Creek
Yadkin River
Lasater Rd
S Peace Haven Rd
Jonestown Rd
Griffith Rd
Ardmore Rd
Pope Rd
Ebert Rd
W Clemmonsville Rd
S Main St
Barnes Rd
Middlebrook Dr
Hampton Rd
Cooper Rd
Idols Rd
Underpass Rd
Frye Bridge Rd
Central Rd
Hartman Rd
Mt Olivet Church Rd
S Union Grove Rd
Payne Rd
Old U.S. 52
Community Rd
Enterprise Rd
Markland Rd
Ruff Leonard Rd
Welcome-Arcadia Rd
Craver Rd
Baileys Chapel Rd
1171
1166
1165
421
40
67
52
150
158
801
2995
1621
1441

The Case for STEM Education as a National Priority:
Good Jobs and American Competitiveness

Updated June 2013

Why is STEM Education a National Priority?

"60 percent of U.S. employers are having difficulties finding qualified workers to fill vacancies at their companies."

-Council on Foreign Relations[1]

"STEM occupations will grow 1.7 times faster than non-STEM occupations over the period from 2008 - 2018"

-Office of Science and Technology and Policy[2]

"In the current overall employment market, unemployed people outnumber job postings 3.6 to one. In the STEM occupations, job postings outnumbered unemployed people by 1.9 to one."

"STEM employment is expected to grow 17% between 2008 and 2018, far faster than the 10% growth projected for overall employment"

-Change the Equation[3]

"At all levels of educational attainment, STEM job holders earn 11 percent higher wages compared with their same-degree counterparts in other jobs."

"The top 10 bachelor-degree majors with the highest median earnings are all in STEM fields."

"The average annual wage for all STEM occupations was $77,880 in May 2009, significantly above the U.S. average of $43,460 for non-STEM occupations."

"In 2010, the unemployment rate for STEM workers was 5.3 percent; for all other occupations, it was 10 percent."

-National Governors Association Center for Best Practices[4]

"47 percent of Bachelor's degrees in STEM occupations earn more than PhDs in non-STEM occupations."

-Georgetown Center for Education and the Workforce[5]

"STEM workers drive our nation's innovation and competitiveness by generating new ideas, new companies and new industries. However, U.S. businesses frequently voice concerns over the supply and availability of STEM workers. Over the past 10 years, growth in STEM jobs was three times as fast as growth in non-STEM jobs."

-STEM: Good Jobs Now and for the Future, U.S. Department of Commerce[6]

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1 http://www.cfr.org/united-states/us-education-reform-national-security/p27618
2 http://www.whitehouse.gov/blog/2012/12/18/one-decade-one-million-more-stem-graduates
3 http://changetheequation.org/stemdemand
4 http://www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-edu-publications/col2-content/main-content-list/building- a-science-technology-en-1.html
5 http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/STEMWEBINAR.pdf
6 http://www.esa.doc.gov/sites/default/files/reports/documents/stemfinaljuly14.pdf

How is the U.S. Doing in STEM Education?

"Although most parents of K–12 students (93 percent) believe that STEM education should be a priority in the U.S., only half (49 percent) agreed that it actually is a top priority for this country."

"Only one in five STEM college students felt that their K–12 education prepared them extremely well for their college courses in STEM."

-Microsoft STEM Survey[7]

"Only 45 percent of U.S. high school graduates in 2011 were ready for college work in math and 30 percent were ready in science."

"In 2009, just 34 percent of U.S. 8th graders were rated proficient or higher in a national math assessment, and more than one in four scored below the basic level."

"Only one out of five households has access to and takes advantage of STEM-related after-school programming."

"In almost every state, children will get less time for science in elementary school than they did 15-20 years ago."

-Change the Equation[8]

"Fewer than 40 percent of students who enter college intending to major in a STEM field complete a STEM degree."

-Office of Science and Technology and Policy [9]

"Fifty-four percent of the nation's 4th graders and 47 percent of its 8th graders report that they "never or hardly ever" write reports about science projects. Thirty-nine percent of 8th graders report that they "never or hardly ever" design a science experiment."

"The average mathematics literacy score of U.S. 15-year olds declined about 9 points from 2003 to 2006, and then rose about 13 points in 2009, placing the United States below 17 of 33 other members of the Organization for Economic Co-operation and Development (OECD)."

"The average science literacy score of U.S. 15-year-olds was not measurably different from the 2009 OECD average, though it improved by 3 points from 2006 to 2009. The U.S. score was lower than the score of 12 out of 33 other OECD nations participating in the assessment."

"About half of Americans said that their local public schools did not put enough emphasis on teaching science and math, an equal portion (48%) said the emphasis was about right, and just 2% said there was too much emphasis on teaching science and math in the local schools (Rose and Gallup 2007)."

-National Science Foundation's 2012 Science and Engineering Indicators[10]

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[7] http://www.microsoft.com/presspass/press/2011/sep11/09-07MSSTEMSurveyPR.mspx
[8] http://www.changetheequation.org/sites/default/files/CTEq_VitalSigns2011_National_0.pdf
[9] http://www.whitehouse.gov/blog/2012/12/18/one-decade-one-million-more-stem-graduates
[10] http://www.nsf.gov/statistics/seind12/

STC

SCIENCE AND TECHNOLOGY CONCEPTS™

A Correlation of STC-Elementary 3rd Edition to the North Carolina Common Core State and Essential Standards: Science, Grades K-5

Smithsonian Institution
National Science Resources Center

CAROLINA®
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Smithsonian Institution
National Science Resources Center

Science and Technology Concepts™ Program

Learning Framework

	Life *Sciences*	**Earth** *Sciences*	**Physical** *Sciences*	
	Life on Earth	Earth's Dynamic Systems	Chemistry	Physics
Grade K	Exploring Plants and Animals	Exploring My Weather	Exploring Properties	Exploring Forces and Motion
		Exploring Sun, Moon, and Sky	Exploring Senses and Safety	
Grades 1–5	Organisms	Weather	Solids and Liquids	Comparing and Measuring
	The Life Cycle of Butterflies	Soils	Changes	Balancing and Weighing
	Plant Growth and Development	Rocks and Minerals	Chemical Tests	Sound
	Animal Studies	Land and Water	Food Chemistry	Electric Circuits
	Microworlds	Ecosystems	Floating and Sinking	Motion and Design
Grades 6–8	Investigating Digestion and Motion	Understanding Weather and Climate	Exploring the Properties of Matter	Experimenting with Forces and Motion
	Exploring Respiration and Circulation	Researching the Sun-Earth-Moon System	Experimenting with Mixtures, Compounds, and Elements	Working with Motors and Simple Machines
	Investigating Biodiversity and Interdependence	Exploring Planetary Systems		Investigating Circuit Design
	Studying the Development and Reproduction of Organisms	Exploring Plate Tectonics		Exploring the Nature of Light
				Discovering Electrical Systems
				Researching Optical Systems

North Carolina Common Core State and Essential Standards - Science
Grades K-5, Adopted 2010

Grade K

CONTENT AREA / STRAND NC.K.P.
Physical Science

Standards	Titles That Meet
INDICATOR K.P.1.2.a. Straight	**STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 03 Ext. p. 23, Lesson 04 pp. 29-39, Lesson 05 Ext. p. 45, Lesson 09 pp. 69-78, Lesson 17 pp. 131-133 **STC Elementary Literacy Series: Solids and Liquids**: pp. 04-11
INDICATOR K.P.1.2.b. Zigzag	**STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 03 Ext. p. 23, Lesson 04 pp. 29-39, Lesson 05 Ext. p. 45, Lesson 09 pp. 69-78, Lesson 17 pp. 131-133 **STC Elementary Literacy Series: Solids and Liquids**: pp. 04-11
INDICATOR K.P.1.2.c. Round and round	**STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 03 Ext. p. 23, Lesson 04 pp. 29-39, Lesson 05 Ext. p. 45, Lesson 09 pp. 69-78, Lesson 17 pp. 131-133 **STC Elementary Literacy Series: Solids and Liquids**: pp. 04-11
INDICATOR K.P.1.2.d. Back and forth	**STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 03 Ext. p. 23, Lesson 04 pp. 29-39, Lesson 05 Ext. p. 45, Lesson 09 pp. 69-78, Lesson 17 pp. 131-133 **STC Elementary Literacy Series: Solids and Liquids**: pp. 04-11

CONTENT AREA / STRAND NC.K.P.
Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE K.P.2.1. Classify objects by observable physical properties (including size, color, shape, texture, weight and flexibility).	**STC Elementary 3rd Edition TG: Comparing and Measuring**: Appendix A pp. 115-116, Lesson 01 pp. 03-10, Lesson 02 Ext. p. 14, Lesson 02 Lit. p. 14, Lesson 02 pp. 11-14, Lesson 03 Lit. p. 19, Lesson 03 pp. 15-19, Lesson 04 Ext. p. 26, Lesson 04 Lit. p. 26, Lesson 04 pp. 21-28, Lesson 05 Lit. p. 33, Lesson 05 pp. 29-40, Lesson 12 Lit. p. 83 **STC Elementary 3rd Edition TG: Organisms**: Appendix C pp. 193-194, Lesson 02 Ext. p. 17, Lesson 02 pp. 11-20, Lesson 07 pp. 79-89, Lesson 08 pp. 91-100, Lesson 13 pp. 137-149, Lesson 14 pp. 151-156, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Solids and Liquids**: Appendix A pp. 139-140, Lesson 01 Ext. p. 08, Lesson 01 pp. 03-09, Lesson 02 Ext. pp. 16-17, Lesson 02 pp. 11-17, Lesson 03 Ext. p. 23, Lesson 03 pp. 19-27, Lesson 04 Ext. pp. 34-35, Lesson 04 pp. 29-39, Lesson 05 Ext. p. 45, Lesson 05 pp. 41-45, Lesson 06 Ext. p. 52, Lesson 06 pp. 47-53, Lesson 07 Ext. p. 60, Lesson 07 pp. 55-61, Lesson 08 Ext. p. 67, Lesson 08 pp. 63-67, Lesson 09 Ext. pp. 73-74, Lesson 09 pp. 69-78, Lesson 10 Ext. p. 84, Lesson 10 pp. 79-84, Lesson 11 Ext. p. 91, Lesson 11 pp. 85-91, Lesson 12 Ext. p. 97, Lesson 12 pp. 93-98, Lesson 13 Ext. p.

TG- Teacher's Guide
Ext- Extension
Lit- Literacy

Grade K	
	103, Lesson 13 pp. 99-104, Lesson 14 Ext. p. 111, Lesson 14 pp. 105-116, Lesson 15 Ext. p. 121, Lesson 15 pp. 117-124, Lesson 16 Ext. p. 129, Lesson 16 pp. 125-129, Lesson 17 pp. 131-133 **STC Elementary 3rd Edition TG: Weather**: Appendix A pp. 155-156, Lesson 03 Ext. p. 25, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 12 Ext. pp. 104-105, Lesson 12 pp. 101-108, Lesson 13 pp. 109-112, Lesson 14 Ext. p. 116, Lesson 14 pp. 113-118 **STC Elementary Literacy Series: Comparing and Measuring**: pp. 04-05, pp. 06-07, pp. 08-09, pp. 10-11, pp. 30-31 **STC Elementary Literacy Series: Solids and Liquids**: pp. 02-03, pp. 04-11, pp. 12-13, pp. 14-15, pp. 16-17, pp. 18-19, pp. 20-21, pp. 22-23, pp. 24-27, pp. 28-31, pp. 32-33, pp. 34-35 **KIDS DISCOVER: Measuring**: pp. 1-15 **KIDS DISCOVER: Solids and Liquids**: pp. 1-15
CLARIFYING OBJECTIVE K.P.2.2. Compare the observable physical properties of different kinds of materials (clay, wood, cloth, paper, etc) from which objects are made and how they are used.	**STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 01 Ext. p. 08, Lesson 01 pp. 03-09, Lesson 02 Ext. pp. 16-17, Lesson 02 pp. 11-17, Lesson 03 Ext. p. 23, Lesson 03 pp. 19-27, Lesson 04 Ext. pp. 34-35, Lesson 04 pp. 29-39, Lesson 05 Ext. p. 45, Lesson 05 pp. 41-45, Lesson 06 Ext. p. 52, Lesson 06 pp. 47-53, Lesson 07 Ext. p. 60, Lesson 07 pp. 55-61, Lesson 08 Ext. p. 67, Lesson 08 pp. 63-67, Lesson 09 Ext. pp. 73-74, Lesson 09 pp. 69-78, Lesson 10 pp. 79-84, Lesson 11 Ext. p. 91, Lesson 11 pp. 85-91, Lesson 12 Ext. p. 97, Lesson 12 pp. 93-98, Lesson 13 Ext. p. 103, Lesson 13 pp. 99-104, Lesson 14 Ext. p. 111, Lesson 14 pp. 105-116, Lesson 15 Ext. p. 121, Lesson 15 pp. 117-124, Lesson 16 Ext. p. 129, Lesson 16 pp. 125-129, Lesson 17 pp. 131-133 **STC Elementary Literacy Series: Solids and Liquids**: pp. 02-03, pp. 04-11, pp. 14-15, pp. 16-17
CONTENT AREA / STRAND NC.K.E. Earth Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE K.E.1.1. Infer that change is something that happens to many things in the environment based on observations made using one or more of their senses.	**STC Elementary 3rd Edition TG: Weather**: Lesson 07 pp. 55-61, Lesson 08 Ext. p. 68, Lesson 08 pp. 63-72, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 11 pp. 91-100
CLARIFYING OBJECTIVE K.E.1.2. Summarize daily weather conditions noting changes that occur from day to day and throughout the year.	**STC Elementary 3rd Edition TG: Weather**: Lesson 01 pp. 3-8, Lesson 02 Ext. p. 14, Lesson 02 pp. 9-19, Lesson 03 Ext. p. 25, Lesson 03 pp. 21-26, Lesson 04 pp. 27-35, Lesson 05 pp. 37-48, Lesson 06 Ext. p. 52, Lesson 06 pp. 49-54, Lesson 07 Ext. p. 59, Lesson 07 pp. 55-61, Lesson 10 Ext. p. 85, Lesson 10 pp. 81-89, Lesson 11 Ext. p. 95, Lesson 13 pp. 109-112, Lesson 15 Ext. p. 122, Lesson 15 pp. 119-123

TG- Teacher's Guide
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Grade K	
	STC Elementary Literacy Series: Weather: p. 06
CLARIFYING OBJECTIVE K.E.1.3. Compare weather patterns that occur from season to season.	**STC Elementary 3rd Edition TG: Weather**: Lesson 03 pp. 21-26, Lesson 04 Ext. p. 32, Lesson 05 Ext. p. 42, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 10 pp. 81-89, Lesson 16 pp. 125-133 **STC Elementary Literacy Series: Weather**: pp. 17-19, pp. 20-21 **KIDS DISCOVER: Weather**: pp. 1-15
CONTENT AREA / STRAND NC.K.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE K.L.1.1. Compare different types of the same animal (i.e. different types of dogs, different types of cats, etc.) to determine individual differences within a particular type of animal.	**STC Elementary 3rd Edition TG: Organisms**: Appendix C pp. 193-194, Lesson 07 pp. 79-89, Lesson 08 Ext. p. 99, Lesson 08 pp. 91-100, Lesson 09 Ext. p. 105, Lesson 09 pp. 101-108, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 14 Ext. p. 156, Lesson 14 pp. 151-156, Lesson 15 Ext. p. 162, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Weather**: Lesson 12 pp. 101-108 **STC Elementary Literacy Series: Organisms**: p. 36, pp. 14-15, pp. 18-19
CONTENT AREA / STRAND NC.K.L. Life Science	
Standards	**Titles That Meet**
INDICATOR K.L.1.2.a. Structure	**STC Elementary 3rd Edition TG: Comparing and Measuring**: Appendix A pp. 115-116, Lesson 05 Lit. p. 33 **STC Elementary 3rd Edition TG: Organisms**: Lesson 02 Ext. p. 17, Lesson 02 pp. 11-20, Lesson 07 pp. 79-89, Lesson 08 pp. 91-100, Lesson 13 pp. 137-149, Lesson 14 pp. 151-156, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Solids and Liquids**: Appendix A pp. 139-140, Lesson 01 pp. 03-09, Lesson 02 pp. 11-17, Lesson 03 pp. 19-27, Lesson 04 pp. 29-39, Lesson 05 Ext. p. 45, Lesson 06 Ext. p. 52, Lesson 06 pp. 47-53, Lesson 09 pp. 69-78, Lesson 10 pp. 79-84, Lesson 12 Ext. p. 97, Lesson 14 Ext. p. 111, Lesson 14 pp. 105-116, Lesson 16 pp. 125-129, Lesson 17 pp. 131-133 **STC Elementary 3rd Edition TG: Weather**: Appendix A pp. 155-156 **STC Elementary Literacy Series: Comparing and Measuring**: pp. 10-11 **STC Elementary Literacy Series: Solids and Liquids**: pp. 04-11, pp. 28-31, pp. 34-35

TG- Teacher's Guide
Ext- Extension
Lit- Literacy

Grade K	
	KIDS DISCOVER: Solids and Liquids: pp. 1-15
INDICATOR K.L.1.2.b. Growth	**STC Elementary 3rd Edition TG: Comparing and Measuring**: Lesson 03 Lit. p. 19, Lesson 04 Lit. p. 26, Lesson 12 Ext. p. 83 **STC Elementary 3rd Edition TG: Organisms**: Appendix C pp. 193-194, Lesson 02 pp. 11-20, Lesson 03 Ext. pp. 31-32, Lesson 03 pp. 21-37, Lesson 06 pp. 69-78, Lesson 08 pp. 91-100, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 13 pp. 137-149, Lesson 14 pp. 151-156, Lesson 15 pp. 157-169, Lesson 16 Ext. p. 176, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary Literacy Series: Comparing and Measuring**: pp. 06-07, pp. 08-09 **STC Elementary Literacy Series: Organisms**: p. 04, p. 06, p. 29, p. 33, pp. 08-09 **KIDS DISCOVER: Organisms**: pp. 1-15
INDICATOR K.L.1.2.c. Changes	**STC Elementary 3rd Edition TG: Comparing and Measuring**: Lesson 03 Lit. p. 19 **STC Elementary 3rd Edition TG: Organisms**: Lesson 03 pp. 21-37, Lesson 04 pp. 39-54, Lesson 05 pp. 55-67, Lesson 06 pp. 69-78, Lesson 09 pp. 101-108, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 13 pp. 137-149, Lesson 15 Ext. p. 162, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 04 pp. 29-39, Lesson 09 pp. 69-78, Lesson 14 pp. 105-116 **STC Elementary 3rd Edition TG: Weather**: Lesson 07 pp. 55-61, Lesson 08 Ext. p. 68, Lesson 08 pp. 63-72, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 11 pp. 91-100 **STC Elementary Literacy Series: Comparing and Measuring**: pp. 06-07 **STC Elementary Literacy Series: Organisms**: pp. 08-09
INDICATOR K.L.1.2.d. Movement	**STC Elementary 3rd Edition TG: Organisms**: Lesson 07 Ext. pp. 85-86, Lesson 07 pp. 79-89, Lesson 08 pp. 91-100, Lesson 09 pp. 101-108, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 13 pp. 137-149, Lesson 14 Ext. p. 156, Lesson 14 pp. 151-156 **STC Elementary Literacy Series: Comparing and Measuring**: p. 36
INDICATOR K.L.1.2.e. Basic needs	**STC Elementary 3rd Edition TG: Organisms**: Lesson 01 pp. 03-10, Lesson 03 Ext. pp. 31-32, Lesson 03 pp. 21-37, Lesson 04 pp. 39-54, Lesson 06 pp. 69-78, Lesson 07 pp. 79-89, Lesson 08 pp. 91-100, Lesson 09 pp. 101-108, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 13 pp. 137-149, Lesson 14 Ext. p. 156, Lesson 14 pp. 151-156, Lesson 15 Ext. p. 162, Lesson 15 pp. 157-169,

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 1.P.1.1. Explain the importance of a push or pull to changing the motion of an object.	**STC Elementary 3rd Edition TG: Balancing and Weighing**: Lesson 01 Ext. p. 7, Lesson 01 pp. 3-8, Lesson 02 Ext. p. 13, Lesson 02 pp. 9-13, Lesson 05 Ext. p. 39, Lesson 05 pp. 33-41, Lesson 06 Ext. p. 49, Lesson 06 pp. 43-52, Lesson 07 Ext. p. 56, Lesson 07 pp. 53-57, Lesson 08 Ext. p. 66, Lesson 08 pp. 59-69, Lesson 09 Ext. p. 75, Lesson 09 pp. 71-76, Lesson 10 Ext. pp. 82-83, Lesson 10 pp. 77-84, Lesson 11 Ext. pp. 90-91, Lesson 11 pp. 85-95, Lesson 17 pp. 129-130 **STC Elementary Literacy Series: Balancing and Weighing**: p. 36, pp. 02-07, pp. 08-09, pp. 10-15, pp. 16-21, pp. 32-33 **KIDS DISCOVER: Weight and Balance**: pp. 1-15
CLARIFYING OBJECTIVE 1.P.1.2. Explain how some forces (pushes and pulls) can be used to make things move without touching them, such as magnets.	**STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 07 Ext. p. 60, Lesson 07 pp. 55-61, Lesson 16 pp. 125-129 **STC Elementary Literacy Series: Solids and Liquids**: pp. 14-15 **KIDS DISCOVER: Weight and Balance**: pp. 1-15
CLARIFYING OBJECTIVE 1.P.1.3. Predict the effect of a given force on the motion of an object, including balanced forces.	**STC Elementary 3rd Edition TG: Balancing and Weighing**: Lesson 01 Ext. p. 7, Lesson 01 pp. 3-8, Lesson 02 Ext. p. 13, Lesson 02 pp. 9-13, Lesson 05 Ext. p. 39, Lesson 05 pp. 33-41, Lesson 06 Ext. p. 49, Lesson 06 pp. 43-52, Lesson 07 Ext. p. 56, Lesson 07 pp. 53-57, Lesson 08 Ext. p. 66, Lesson 08 pp. 59-69, Lesson 09 Ext. p. 75, Lesson 09 pp. 71-76, Lesson 10 Ext. pp. 82-83, Lesson 10 pp. 77-84, Lesson 11 Ext. pp. 90-91, Lesson 11 pp. 85-95, Lesson 17 pp. 129-130 **STC Elementary Literacy Series: Balancing and Weighing**: p. 36, pp. 02-07, pp. 08-09, pp. 10-15, pp. 16-21, pp. 32-33 **KIDS DISCOVER: Weight and Balance**: pp. 1-15

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Earth Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 1.E.1.1. Recognize differences in the features of the day and night sky and apparent movement of objects across the sky as observed from Earth.	**STC Elementary 3rd Edition TG: Weather**: Lesson 13 pp. 109-112

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CLARIFYING OBJECTIVE 1.E.2.1. Summarize the physical properties of Earth materials, including rocks, minerals, soils and water that make them useful in different ways.	**STC Elementary 3rd Edition TG: Changes**: Lesson 01 pp. 3-20, Lesson 02 Ext. pp. 27-29, Lesson 02 pp. 21-30, Lesson 03 Ext. p. 37, Lesson 03 pp. 31-41, Lesson 04 Ext. p. 49, Lesson 04 pp. 43-51, Lesson 09 Ext. p. 91 **STC Elementary 3rd Edition TG: Organisms**: Lesson 04 pp. 39-54 **STC Elementary 3rd Edition TG: Soils**: Appendix C pp. 173-174, Lesson 01 pp. 3-16, Lesson 02 Ext. p. 24, Lesson 02 pp. 17-25, Lesson 03 Ext. pp. 33-34, Lesson 03 pp. 27-36, Lesson 04 pp. 37-43, Lesson 05 Ext. p. 51, Lesson 05 pp. 45-55, Lesson 06 Ext. p. 61, Lesson 06 pp. 57-63, Lesson 07 pp. 65-71, Lesson 07 Ext. pp. 69-70, Lesson 08 Ext. p. 80, Lesson 08 pp. 73-86, Lesson 09 pp. 87-95, Lesson 09 Ext. p. 93, Lesson 10 Ext. p. 103, Lesson 10 pp. 97-106, Lesson 11 Ext. p. 111, Lesson 11 pp. 107-111, Lesson 12 Ext. p. 118, Lesson 12 pp. 113-120, Lesson 13 Ext. p. 126-127, Lesson 13 pp. 121-131, Lesson 14 Ext. p. 138, Lesson 14 pp. 133-142, Lesson 15 Ext. p. 149, Lesson 15 pp. 143-151, Lesson 16 pp. 153-162, Lesson 17 pp. 163-164 **STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 04 Ext. pp. 34-35, Lesson 04 pp. 29-39, Lesson 10 Ext. p. 84 **STC Elementary 3rd Edition TG: Weather**: Lesson 08 Ext. p. 68, Lesson 08 pp. 63-72, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 11 Ext. p. 95, Lesson 11 pp. 91-100, Lesson 12 Ext. pp. 104-105, Lesson 12 pp. 101-108 **STC Elementary Literacy Series: Changes**: p. 36, pp. 04-07, pp. 30-33 **STC Elementary Literacy Series: Soils**: p. 02, p. 28, p. 29, p. 36, pp. 03-06, pp. 07-09, pp. 10-11, pp. 14-17, pp. 18-19, pp. 22-27, pp. 30-31, pp. 32-33, pp. 34-35 **STC Elementary Literacy Series: Solids and Liquids**: p. 36, pp. 04-11 **STC Elementary Literacy Series: Weather**: p. 16, pp. 17-19, pp. 22-23 **KIDS DISCOVER: Changes**: pp. 1-15 **KIDS DISCOVER: Soil**: pp. 1-15
CLARIFYING OBJECTIVE 1.E.2.2. Compare the properties of soil samples from different places relating their capacity to retain water, nourish and support the growth of certain plants.	**STC Elementary 3rd Edition TG: Changes**: Lesson 04 Ext. p. 49, Lesson 04 pp. 43-51 **STC Elementary 3rd Edition TG: Organisms**: Lesson 04 pp. 39-54 **STC Elementary 3rd Edition TG: Soils**: Appendix C pp. 173-174, Lesson 01 pp. 3-16, Lesson 02 Ext. p. 24, Lesson 02 pp. 17-25, Lesson 03 Ext. pp. 33-34, Lesson 03 pp. 27-36, Lesson 04 pp. 37-43, Lesson 05 Ext. p. 51, Lesson 05 pp. 45-55, Lesson 06 Ext. p. 61, Lesson 06 pp. 57-63, Lesson 07 pp. 65-71, Lesson 07 Ext. pp. 69-70, Lesson 08 Ext. p. 80, Lesson 08 pp. 73-86, Lesson 09 pp. 87-95, Lesson 09

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CONTENT AREA / STRAND NC.1.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 1.L.1.1. Recognize that plants and animals need air, water, light (plants only), space, food and shelter and that these may be found in their environment.	**STC Elementary 3rd Edition TG: Organisms**: Appendix C pp. 193-194, Lesson 01 pp. 03-10, Lesson 03 Ext. pp. 31-32, Lesson 03 pp. 21-37, Lesson 04 pp. 39-54, Lesson 05 Ext. p. 63, Lesson 05 pp. 55-67, Lesson 06 pp. 69-78, Lesson 07 Ext. pp. 85-86, Lesson 07 pp. 79-89, Lesson 08 pp. 91-100, Lesson 09 pp. 101-108, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 13 pp. 137-149, Lesson 14 Ext. p. 156, Lesson 14 pp. 151-156, Lesson 15 Ext. p. 162, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Soils**: Lesson 02 pp. 17-25, Lesson 07 pp. 65-71, Lesson 09 pp. 87-95, Lesson 09 Ext. p. 93, Lesson 10 Ext. p. 103, Lesson 10 pp. 97-106, Lesson 11 pp. 107-111, Lesson 12 Ext. p. 118, Lesson 12 pp. 113-120, Lesson 13 pp. 121-131, Lesson 14 pp. 133-142, Lesson 15 pp. 143-151, Lesson 16 pp. 153-162 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Lesson 02 Ext. pp. 14-15, Lesson 02 pp. 11-17, Lesson 03 Ext. p. 21, Lesson 03 pp. 19-22, Lesson 10 pp. 63-67, Lesson 12 pp. 77-80, Lesson 16 pp. 95-96 **STC Elementary 3rd Edition TG: Weather**: Lesson 08 Ext. p. 68, Lesson 08 pp. 63-72, Lesson 11 pp. 91-100 **STC Elementary Literacy Series: Organisms**: p. 02, p. 06, p. 07, p. 12, p. 13, p. 16, p. 17, p. 32, pp. 10-11, pp. 14-15, pp. 18-19, pp. 20-21, pp. 22-23, pp. 26-28, pp. 30-31, pp. 34-35 **STC Elementary Literacy Series: Soils**: pp. 10-11, pp. 12-13, pp. 14-17, pp. 22-27 **STC Elementary Literacy Series: The Life Cycle of Butterflies**: p. 36, pp. 04-07, pp. 26-27, pp. 34-35 **STC Elementary Literacy Series: Weather**: p. 16, pp. 22-23 **KIDS DISCOVER: Butterflies**: pp. 1-15

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CLARIFYING OBJECTIVE 1.L.1.2. Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.	**STC Elementary 3rd Edition TG: Organisms**: Appendix C pp. 193-194, Lesson 04 pp. 39-54, Lesson 05 Ext. p. 63, Lesson 05 pp. 55-67, Lesson 07 Ext. pp. 85-86, Lesson 07 pp. 79-89, Lesson 08 pp. 91-100, Lesson 09 pp. 101-108, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 13 pp. 137-149, Lesson 14 pp. 151-156, Lesson 15 Ext. p. 162, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Soils**: Lesson 02 pp. 17-25, Lesson 09 Ext. p. 93, Lesson 10 pp. 97-106 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Lesson 02 Ext. pp. 14-15, Lesson 03 pp. 19-22, Lesson 12 pp. 77-80 **STC Elementary Literacy Series: Organisms**: p. 12, p. 13, p. 16, p. 17, p. 24, p. 25, p. 32, pp. 10-11, pp. 14-15, pp. 18-19, pp. 20-21, pp. 22-23, pp. 26-28, pp. 30-31, pp. 34-35 **STC Elementary Literacy Series: The Life Cycle of Butterflies**: p. 36, pp. 04-07, pp. 26-27, pp. 34-35 **KIDS DISCOVER: Organisms**: pp. 1-15 **KIDS DISCOVER: Soil**: pp. 1-15
CLARIFYING OBJECTIVE 1.L.1.3. Summarize ways that humans protect their environment and/or improve conditions for the growth of the plants and animals that live there. (e.g., reuse or recycle products to avoid littering.)	**STC Elementary 3rd Edition TG: Changes**: Lesson 06 Ext. pp. 68-70, Lesson 06 pp. 63-70 **STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 09 pp. 69-78, Lesson 14 pp. 105-116 **STC Elementary Literacy Series: Changes**: pp.34-35 **STC Elementary Literacy Series: Solids and Liquids**: pp. 18-19, pp. 34-35
CONTENT AREA / STRAND NC.1.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 1.L.2.1. Summarize the basic needs of a variety of different plants (including air, water, nutrients, and light) for energy and growth.	**STC Elementary 3rd Edition TG: Organisms**: Lesson 16 Ext. p. 176, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary Literacy Series: Organisms**: pp. 30-31 **KIDS DISCOVER: Organisms**: pp. 1-15
CLARIFYING OBJECTIVE 1.L.2.2. Summarize the basic needs of a variety of	**STC Elementary 3rd Edition TG: Organisms**: Lesson 01 pp. 03-10, Lesson 05 pp. 55-67, Lesson 07 pp. 79-89, Lesson

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different animals (including air, water, and food) for energy and growth.	08 pp. 91-100, Lesson 09 pp. 101-108, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 13 pp. 137-149, Lesson 14 Ext. p. 156, Lesson 14 pp. 151-156, Lesson 15 Ext. p. 162, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Soils**: Lesson 02 pp. 17-25 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Lesson 02 Ext. pp. 14-15, Lesson 02 pp. 11-17, Lesson 03 Ext. p. 21, Lesson 03 pp. 19-22, Lesson 10 pp. 63-67, Lesson 12 pp. 77-80, Lesson 16 pp. 95-96 **STC Elementary 3rd Edition TG: Weather**: Lesson 08 Ext. p. 68, Lesson 08 pp. 63-72, Lesson 11 pp. 91-100 **STC Elementary Literacy Series: Organisms**: p. 02, pp. 18-19, pp. 26-28 **STC Elementary Literacy Series: The Life Cycle of Butterflies**: pp. 04-07, pp. 26-27 **STC Elementary Literacy Series: Weather**: p. 16, pp. 22-23 **KIDS DISCOVER: Butterflies**: pp. 1-15 **KIDS DISCOVER: Organisms**: pp. 1-15 **KIDS DISCOVER: Soil**: pp. 1-15

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 2.P.1.1. Illustrate how sound is produced by vibrating objects and columns of air.	**STC Elementary 3rd Edition TG: Sound**: Appendix B pp. 119-120, Lesson 01 Ext. p. 8, Lesson 01 pp. 3-9, Lesson 02 Ext. p. 15, Lesson 02 pp. 11-15, Lesson 03 Ext. p. 21, Lesson 03 pp. 17-22, Lesson 04 Ext. p. 26, Lesson 04 pp. 23-31, Lesson 05 Ext. p. 37, Lesson 05 pp. 33-38, Lesson 06 pp. 39-49, Lesson 07 pp. 51-58, Lesson 08 Ext. pp. 64-65, Lesson 08 pp. 59-68, Lesson 09 Ext. p. 73, Lesson 09 pp. 69-74, Lesson 10 pp. 75-78, Lesson 11 pp. 79-83, Lesson 12 pp. 85-88, Lesson 13 pp. 89-92, Lesson 14 Ext. p. 97, Lesson 14 pp. 93-100, Lesson 15 pp. 101-109, Lesson 16 pp. 111-114, Lesson 17 pp. 115-116 **STC Elementary Literacy Series: Sound**: pp. 05-06, pp. 07-10, pp. 16-17, pp. 23-25 **KIDS DISCOVER: The 5 Senses**: pp. 1-19
CLARIFYING OBJECTIVE 2.P.1.2. Summarize the relationship between sound and objects of the body that vibrate - eardrum and vocal cords.	**STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 03 pp. 25-37 **STC Elementary 3rd Edition TG: Sound**: Appendix B pp. 119-120, Lesson 01 Ext. p. 8, Lesson 01 pp. 3-9, Lesson 02 Ext. p. 15, Lesson 02 pp. 11-15, Lesson 03 Ext. p. 21, Lesson 03 pp. 17-22, Lesson 04 Ext. p. 26, Lesson 04 pp. 23-31, Lesson 05 Ext. p. 37, Lesson 05 pp. 33-38, Lesson 06 Ext. p, 43, Lesson 06 pp. 39-49, Lesson 07 Ext. p. 54, Lesson 07 pp. 51-58, Lesson 08 Ext. pp. 64-65, Lesson 08 pp. 59-68, Lesson 09 Ext. p. 73, Lesson 09 pp. 69-74, Lesson 10 pp. 75-78, Lesson 11 pp. 79-83, Lesson 12 pp. 85-88, Lesson 13 pp. 89-92, Lesson 14 Ext. p. 97, Lesson 14 pp. 93-100, Lesson 15 pp. 101-109, Lesson 16 pp. 111-114, Lesson 17 pp. 115-116 **STC Elementary 3rd Edition TG: Weather**: Lesson 02 pp. 9-19 **STC Elementary Literacy Series: Chemical Tests**: pp. 18-20 **STC Elementary Literacy Series: Sound**: p. 22, pp. 05-06, pp. 07-10, pp. 16-17, pp. 18-21, pp. 23-25, pp. 29-31, pp. 32-34 **KIDS DISCOVER: The 5 Senses**: pp. 1-19

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 2.P.2.1. Give examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling.	**STC Elementary 3rd Edition TG: Changes**: Appendix C pp. 169-170, Lesson 02 Ext. pp. 27-29, Lesson 02 pp. 21-30, Lesson 03 Ext. p. 37, Lesson 03 pp. 31-41, Lesson 06 pp. 63-70, Lesson 09 Ext. p. 91, Lesson 09 pp. 85-93, Lesson 11 Ext. p. 105, Lesson 11 pp. 101-

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	108, Lesson 17 pp. 151-155 **STC Elementary 3rd Edition TG: Chemical Tests**: Appendix B pp. 163-164, Lesson 06 pp. 61-72, Lesson 10 pp. 95-102, Lesson 17 pp. 157-160 **STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 09 pp. 69-78, Lesson 10 Ext. p. 84, Lesson 12 Ext. p. 97, Lesson 15 Ext. p. 121 **STC Elementary Literacy Series: Changes**: pp. 04-07, pp. 30-33 **STC Elementary Literacy Series: Chemical Tests**: pp. 07-10, pp. 14-17 **STC Elementary Literacy Series: Solids and Liquids**: pp. 32-33
CLARIFYING OBJECTIVE 2.P.2.2. Compare the amount (volume and weight) of water in a container before and after freezing.	**STC Elementary 3rd Edition TG: Chemical Tests**: Appendix B pp. 163-164, Lesson 11 pp. 103-108 **STC Elementary Literacy Series: Chemical Tests**: pp. 07-10 **KIDS DISCOVER: Water**: pp. 1-19
CLARIFYING OBJECTIVE 2.P.2.3. Compare what happens to water left in an open container over time as to water left in a closed container.	**STC Elementary 3rd Edition TG: Changes**: Appendix C pp. 169-170, Lesson 02 Ext. pp. 27-29, Lesson 02 pp. 21-30, Lesson 03 Ext. p. 37, Lesson 03 pp. 31-41, Lesson 06 pp. 63-70, Lesson 09 Ext. p. 91, Lesson 09 pp. 85-93, Lesson 11 Ext. p. 105, Lesson 11 pp. 101-108, Lesson 17 pp. 151-155 **STC Elementary 3rd Edition TG: Chemical Tests**: Appendix B pp. 163-164, Lesson 06 pp. 61-72, Lesson 10 pp. 95-102, Lesson 11 pp. 103-108, Lesson 17 pp. 157-160 **STC Elementary 3rd Edition TG: Solids and Liquids**: Lesson 09 pp. 69-78, Lesson 10 Ext. p. 84, Lesson 12 Ext. p. 97, Lesson 15 Ext. p. 121 **STC Elementary Literacy Series: Changes**: pp. 04-07, pp. 30-33 **STC Elementary Literacy Series: Chemical Tests**: pp. 07-10, pp. 14-17 **STC Elementary Literacy Series: Solids and Liquids**: pp. 32-33 **KIDS DISCOVER: Water**: pp. 1-19
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Standards	**Titles That Meet**
INDICATOR 2.E.1.2.a. Temperature	**STC Elementary 3rd Edition TG: Changes**: Lesson 01 pp. 3-20 **STC Elementary 3rd Edition TG: Weather**: Appendix A pp. 155-156, Lesson 01 pp. 3-8, Lesson 05 Ext. p. 42, Lesson

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INDICATOR 2.E.1.2.b. Wind direction	**STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 11 pp. 103-108 **STC Elementary 3rd Edition TG: Weather**: Lesson 01 pp. 3-8, Lesson 02 Ext. p. 14, Lesson 02 pp. 9-19, Lesson 03 Ext. p. 25, Lesson 03 pp. 21-26, Lesson 04 Ext. p. 32, Lesson 04 pp. 27-35, Lesson 05 pp. 37-48, Lesson 06 Ext. p. 52, Lesson 06 pp. 49-54, Lesson 07 Ext. p. 59, Lesson 07 pp. 55-61, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 10 Ext. p. 85, Lesson 10 pp. 81-89, Lesson 14 pp. 113-118, Lesson 15 Ext. p. 122, Lesson 15 pp. 119-123, Lesson 16 pp. 125-133 **STC Elementary Literacy Series: Weather**: p. 02, p. 06, p. 07, pp. 08-09, pp. 10-11, pp. 12-13, pp. 14-15, pp. 20-21, pp. 22-23, pp. 28-29 **KIDS DISCOVER: Water**: pp. 1-19 **KIDS DISCOVER: Weather**: pp. 1-15
INDICATOR 2.E.1.2.c. Wind speed	**STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 11 pp. 103-108 **STC Elementary 3rd Edition TG: Weather**: Lesson 01 pp. 3-8, Lesson 02 Ext. p. 14, Lesson 02 pp. 9-19, Lesson 03 Ext. p. 25, Lesson 03 pp. 21-26, Lesson 04 Ext. p. 32, Lesson 04 pp. 27-35, Lesson 05 pp. 37-48, Lesson 06 Ext. p. 52, Lesson 06 pp. 49-54, Lesson 07 Ext. p. 59, Lesson 07 pp. 55-61, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 10 Ext. p. 85, Lesson 10 pp. 81-89, Lesson 14 pp. 113-118, Lesson 15 Ext. p. 122, Lesson 15 pp. 119-123, Lesson 16 pp. 125-133 **STC Elementary Literacy Series: Weather**: p. 02, p. 06, p. 07, pp. 08-09, pp. 10-11, pp. 12-13, pp. 14-15, pp. 20-21, pp. 22-23, pp. 28-29 **KIDS DISCOVER: Water**: pp. 1-19 **KIDS DISCOVER: Weather**: pp. 1-15
INDICATOR 2.E.1.2.d. Precipitation	**STC Elementary 3rd Edition TG: Weather**: Appendix A pp. 155-156, Lesson 03 pp. 21-26, Lesson 10 Ext. p. 85,

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Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 2.E.1.3. Compare weather patterns that occur over time and relate observable patterns to time of day and time of year.	**STC Elementary 3rd Edition TG: Changes**: Lesson 01 pp. 3-20 **STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 11 pp. 103-108 **STC Elementary 3rd Edition TG: Weather**: Appendix A pp. 155-156, Lesson 02 pp. 9-19, Lesson 03 pp. 21-26, Lesson 04 Ext. p. 32, Lesson 05 Ext. p. 42, Lesson 09 Ext. p. 77, Lesson 09 pp. 73-79, Lesson 10 pp. 81-89, Lesson 15 Ext. p. 122, Lesson 15 pp. 119-123, Lesson 16 pp. 125-133, Lesson 17 pp. 135-136 **STC Elementary Literacy Series: Changes**: pp. 02-03 **STC Elementary Literacy Series: Weather**: pp. 17-19, pp. 20-21, pp. 30-32, pp. 34-35 **KIDS DISCOVER: Water**: pp. 1-19 **KIDS DISCOVER: Weather**: pp. 1-15
CLARIFYING OBJECTIVE 2.E.1.4. Recognize the tools that scientists use for observing, recording, and predicting weather changes from day to day and during the seasons.	**STC Elementary 3rd Edition TG: Weather**: Appendix A pp. 155-156, Lesson 04 pp. 27-35, Lesson 05 pp. 37-48, Lesson 06 Ext. p. 52, Lesson 06 pp. 49-54, Lesson 07 Ext. p. 59, Lesson 07 pp. 55-61, Lesson 10 Ext. p. 85, Lesson 10 pp. 81-89, Lesson 15 Ext. p. 122, Lesson 15 pp. 119-123, Lesson 17 pp. 135-136 **STC Elementary Literacy Series: Weather**: pp. 10-11, pp. 12-13, pp. 14-15, pp. 20-21, pp. 30-32, pp. 34-35 **KIDS DISCOVER: Weather**: pp. 1-15
CONTENT AREA / STRAND NC.2.L. Life Science	
Standards	**Titles That Meet**
INDICATOR 2.L.1.1.a. Birth	**STC Elementary 3rd Edition TG: Organisms**: Lesson 07 pp. 79-89, Lesson 08 Ext. p. 99, Lesson 08 pp. 91-100, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 14 pp. 151-156, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184

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	STC Elementary 3rd Edition TG: Plant Growth and Development: Lesson 11 Lit. p. 66, Lesson 13 Lit. p. 81 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Appendix A pp. 97-99, Lesson 01 pp. 3-10, Lesson 02 pp. 11-17, Lesson 03 pp. 19-22, Lesson 04 pp. 23-28, Lesson 05 pp. 29-33, Lesson 06 pp. 35-39, Lesson 07 Ext. p. 44, Lesson 07 pp. 41-46, Lesson 08 Ext. pp. 50-51, Lesson 08 pp. 47-52, Lesson 09 pp. 53-61, Lesson 10 pp. 63-67, Lesson 11 Ext. pp. 72-74, Lesson 11 pp. 69-75, Lesson 12 Ext. p. 79, Lesson 13 Ext. p. 83, Lesson 13 pp. 81-84, Lesson 15 Ext. p. 93, Lesson 15 pp. 89-94, Lesson 16 pp. 95-96 **STC Elementary Literacy Series: The Life Cycle of Butterflies**: pp. 04-07, pp. 12-15, pp. 16-19, pp. 20-21, pp. 28-31, pp. 32-33 **KIDS DISCOVER: Bees**: pp. 1-19 **KIDS DISCOVER: Butterflies**: pp. 1-15 **KIDS DISCOVER: Organisms**: pp. 1-15
INDICATOR 2.L.1.1.b. Developing into an adult	**STC Elementary 3rd Edition TG: Comparing and Measuring**: Lesson 03 Lit. p. 19 **STC Elementary 3rd Edition TG: Organisms**: Lesson 07 pp. 79-89, Lesson 08 Ext. p. 99, Lesson 08 pp. 91-100, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 14 pp. 151-156, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 11 Lit. p. 66, Lesson 13 Lit. p. 81 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Appendix A pp. 97-99, Lesson 01 pp. 3-10, Lesson 02 pp. 11-17, Lesson 03 pp. 19-22, Lesson 04 pp. 23-28, Lesson 05 pp. 29-33, Lesson 06 pp. 35-39, Lesson 07 Ext. p. 44, Lesson 07 pp. 41-46, Lesson 08 Ext. pp. 50-51, Lesson 08 pp. 47-52, Lesson 09 pp. 53-61, Lesson 10 pp. 63-67, Lesson 11 Ext. pp. 72-74, Lesson 11 pp. 69-75, Lesson 12 Ext. p. 79, Lesson 13 Ext. p. 83, Lesson 13 pp. 81-84, Lesson 15 Ext. p. 93, Lesson 15 pp. 89-94, Lesson 16 pp. 95-96 **STC Elementary Literacy Series: Changes**: p. 36 **STC Elementary Literacy Series: Comparing and Measuring**: pp. 06-07 **STC Elementary Literacy Series: Organisms**: p. 29, p. 33 **STC Elementary Literacy Series: The Life Cycle of Butterflies**: pp. 04-07, pp. 08-11, pp. 12-15, pp. 16-19, pp. 20-21, pp. 28-31, pp. 32-33 **KIDS DISCOVER: Bees**: pp. 1-19

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	KIDS DISCOVER: Butterflies: pp. 1-15 **KIDS DISCOVER: Organisms**: pp. 1-15
INDICATOR 2.L.1.1.c. Reproducing	**STC Elementary 3rd Edition TG: Organisms**: Lesson 14 pp. 151-156 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Lesson 03 pp. 19-22, Lesson 16 pp. 95-96 **KIDS DISCOVER: Butterflies**: pp. 1-15
INDICATOR 2.L.1.1.d. Aging and death	**STC Elementary 3rd Edition TG: Comparing and Measuring**: Lesson 03 Lit. p. 19 **STC Elementary 3rd Edition TG: Organisms**: Lesson 07 pp. 79-89, Lesson 08 Ext. p. 99, Lesson 08 pp. 91-100, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 14 pp. 151-156, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 11 Lit. p. 66, Lesson 13 Lit. p. 81 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Appendix A pp. 97-99, Lesson 01 pp. 3-10, Lesson 02 pp. 11-17, Lesson 03 pp. 19-22, Lesson 04 pp. 23-28, Lesson 05 pp. 29-33, Lesson 06 pp. 35-39, Lesson 07 Ext. p. 44, Lesson 07 pp. 41-46, Lesson 08 Ext. pp. 50-51, Lesson 08 pp. 47-52, Lesson 09 pp. 53-61, Lesson 10 pp. 63-67, Lesson 11 Ext. pp. 72-74, Lesson 11 pp. 69-75, Lesson 12 Ext. p. 79, Lesson 13 Ext. p. 83, Lesson 13 pp. 81-84, Lesson 15 Ext. p. 93, Lesson 15 pp. 89-94, Lesson 16 pp. 95-96 **STC Elementary Literacy Series: Changes**: p. 36 **STC Elementary Literacy Series: Comparing and Measuring**: pp. 06-07 **STC Elementary Literacy Series: Organisms**: p. 29, p. 33 **STC Elementary Literacy Series: The Life Cycle of Butterflies**: pp. 04-07, pp. 08-11, pp. 12-15, pp. 16-19, pp. 20-21, pp. 28-31, pp. 32-33 **KIDS DISCOVER: Bees**: pp. 1-19 **KIDS DISCOVER: Butterflies**: pp. 1-15 **KIDS DISCOVER: Organisms**: pp. 1-15
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CLARIFYING OBJECTIVE 2.L.1.2. Compare life cycles of different animals such as, but not limited to, mealworms, ladybugs, crickets, guppies or frogs.	**STC Elementary 3rd Edition TG: Organisms**: Lesson 07 pp. 79-89, Lesson 08 Ext. p. 99, Lesson 08 pp. 91-100, Lesson 10 Ext. pp. 120-121, Lesson 10 pp. 109-122, Lesson 11 pp. 123-128, Lesson 12 pp. 129-135, Lesson 14 pp. 151-156, Lesson 15 pp. 157-169, Lesson 16 pp. 171-179, Lesson 17 pp. 181-184 **STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 11 Lit. p. 66, Lesson 13 Lit. p. 81 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Appendix A pp. 97-99, Appendix C pp. 111-112, Lesson 01 pp. 3-10, Lesson 02 pp. 11-17, Lesson 03 pp. 19-22, Lesson 04 pp. 23-28, Lesson 05 pp. 29-33, Lesson 06 pp. 35-39, Lesson 07 Ext. p. 44, Lesson 07 pp. 41-46, Lesson 08 Ext. pp. 50-51, Lesson 08 pp. 47-52, Lesson 09 pp. 53-61, Lesson 10 pp. 63-67, Lesson 11 Ext. pp. 72-74, Lesson 11 pp. 69-75, Lesson 12 Ext. p. 79, Lesson 13 Ext. p. 83, Lesson 13 pp. 81-84, Lesson 15 Ext. p. 93, Lesson 15 pp. 89-94, Lesson 16 pp. 95-96 **STC Elementary Literacy Series: The Life Cycle of Butterflies**: p. 36, pp. 02-03, pp. 04-07, pp. 12-15, pp. 16-19, pp. 20-21, pp. 28-31, pp. 32-33, pp. 34-35 **KIDS DISCOVER: Bees**: pp. 1-19 **KIDS DISCOVER: Butterflies**: pp. 1-15 **KIDS DISCOVER: Organisms**: pp. 1-15
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Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 2.L.2.1. Identify ways in which many plants and animals closely resemble their parents in observed appearance and ways they are different.	**STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 03 pp. 13-23, Lesson 16 Lit. p. 102 **STC Elementary 3rd Edition TG: The Life Cycle of Butterflies**: Lesson 02 pp. 11-17 **STC Elementary Literacy Series: Plant Growth and Development**: pp. 34-36 **KIDS DISCOVER: Butterflies**: pp. 1-15

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 3.P.1.1. Infer changes in speed or direction resulting from forces acting on an object.	**STC Elementary 3rd Edition TG: Land and Water**: Lesson 07 pp. 79-89 **STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 04 Ext. p. 45, Lesson 04 pp. 39-50
CLARIFYING OBJECTIVE 3.P.1.2. Compare the relative speeds (faster or slower) of objects that travel the same distance in different amounts of time.	**STC Elementary 3rd Edition TG: Land and Water**: Lesson 07 pp. 79-89 **STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 04 Ext. p. 45, Lesson 04 pp. 39-50
CLARIFYING OBJECTIVE 3.P.1.3. Explain the effects of earth's gravity on the motion of any object on or near the earth.	**STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 03 Ext. pp. 34-35, Lesson 03 pp. 29-38, Lesson 04 Ext. p. 45, Lesson 04 pp. 39-50, Lesson 05 pp. 51-59, Lesson 15 pp. 143-147, Lesson 17 pp. 157-160 **KIDS DISCOVER: Weight and Balance**: pp. 1-15

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 3.P.2.1. Recognize that air is a substance that surrounds us, takes up space and has mass.	**STC Elementary 3rd Edition TG: Changes**: Appendix C pp. 169-170, Lesson 01 pp. 3-20, Lesson 03 Ext. p. 37, Lesson 03 pp. 31-41, Lesson 06 pp. 63-70, Lesson 11 pp. 101-108, Lesson 12 pp. 109-114, Lesson 13 Ext. p. 120, Lesson 13 pp. 115-124, Lesson 15 pp. 133-142, Lesson 16 pp. 143-150, Lesson 17 pp. 151-155 **STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 10 pp. 95-102 **STC Elementary 3rd Edition TG: Sound**: Lesson 02 Ext. p. 15, Lesson 02 pp. 11-15 **STC Elementary Literacy Series: Changes**: pp. 04-07, pp. 30-33, pp.34-35 **STC Elementary Literacy Series: Chemical Tests**: pp. 07-10, pp. 14-17, pp. 21-22
CLARIFYING OBJECTIVE 3.P.2.2. Compare solids, liquids, and gases based on their basic properties.	**STC Elementary 3rd Edition TG: Balancing and Weighing**: Lesson 12 Ext. p. 100, Lesson 12 pp. 97-102, Lesson 13 Ext. p. 108, Lesson 13 pp. 103-109, Lesson 14 Ext. p. 115, Lesson 14 pp. 111-116, Lesson 15 Ext. p. 120, Lesson 15 pp. 117-120, Lesson 16 Ext. p. 126, Lesson 16 pp. 121-128, Lesson 17 pp. 129-130 **STC Elementary 3rd Edition TG: Changes**: Appendix C pp. 169-170, Lesson 01 pp. 3-20, Lesson 02 Ext. pp. 27-29, Lesson 02 pp. 21-30, Lesson 03 Ext. p. 37, Lesson 03 pp. 31-41, Lesson 04 Ext. p. 49, Lesson 04 pp. 43-51, Lesson 05 Ext. p. 60, Lesson 05 pp. 53-62, Lesson 06 pp. 63-70, Lesson 07 Ext. p. 76, Lesson 07 pp. 71-77, Lesson 08 Ext. p. 83, Lesson 08 pp. 79-83, Lesson 09 Ext. p. 91, Lesson 09 pp. 85-93,

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	Lesson 10 Ext. p. 99, Lesson 10 pp. 95-100, Lesson 11 Ext. p. 105, Lesson 11 pp. 101-108, Lesson 12 Ext. p. 114, Lesson 12 pp. 109-114, Lesson 13 Ext. p. 120, Lesson 13 pp. 115-124, Lesson 15 Ext. p. 140, Lesson 15 pp. 133-142, Lesson 16 pp. 143-150, Lesson 17 pp. 151-155 **STC Elementary 3rd Edition TG: Chemical Tests**: Appendix B pp. 163-164, Lesson 03 Ext. pp. 31-32, Lesson 03 pp. 25-37, Lesson 04 Ext. pp. 43-44, Lesson 04 pp. 39-47, Lesson 05 pp. 49-59, Lesson 06 Ext. pp. 65-66, Lesson 06 pp. 61-72, Lesson 07 Ext. p. 77, Lesson 07 pp. 73-80, Lesson 08 pp. 81-85, Lesson 09 pp. 87-93, Lesson 10 pp. 95-102, Lesson 13 pp. 117-123, Lesson 14 pp. 125-134, Lesson 15 Ext. p. 142, Lesson 15 pp. 135-148, Lesson 16 Ext. pp. 152-153, Lesson 16 pp. 149-155 **STC Elementary 3rd Edition TG: Sound**: Lesson 02 Ext. p. 15, Lesson 02 pp. 11-15 **STC Elementary Literacy Series: Changes**: p. 08, p. 09, p. 13, pp. 04-07, pp. 10-11, pp. 14-19, pp. 30-33, pp.34-35 **STC Elementary Literacy Series: Chemical Tests**: pp. 07-10, pp. 14-17, pp. 21-22 **KIDS DISCOVER: Changes**: pp. 1-15
CLARIFYING OBJECTIVE 3.P.2.3. Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water.	**STC Elementary 3rd Edition TG: Changes**: Appendix C pp. 169-170, Lesson 02 Ext. pp. 27-29, Lesson 02 pp. 21-30, Lesson 03 Ext. p. 37, Lesson 03 pp. 31-41, Lesson 04 Ext. p. 49, Lesson 04 pp. 43-51, Lesson 06 pp. 63-70, Lesson 07 Ext. p. 76, Lesson 07 pp. 71-77, Lesson 08 Ext. p. 83, Lesson 08 pp. 79-83, Lesson 09 Ext. p. 91, Lesson 09 pp. 85-93, Lesson 10 Ext. p. 99, Lesson 10 pp. 95-100, Lesson 11 Ext. p. 105, Lesson 11 pp. 101-108, Lesson 12 Ext. p. 114, Lesson 12 pp. 109-114, Lesson 13 Ext. p. 120, Lesson 13 pp. 115-124, Lesson 14 Ext. p. 132, Lesson 14 pp. 125-132, Lesson 15 Ext. p. 140, Lesson 15 pp. 133-142, Lesson 16 pp. 143-150, Lesson 17 pp. 151-155 **STC Elementary 3rd Edition TG: Chemical Tests**: Appendix B pp. 163-164, Lesson 04 Ext. pp. 43-44, Lesson 04 pp. 39-47, Lesson 05 Ext. p. 55, Lesson 06 pp. 61-72, Lesson 07 pp. 73-80, Lesson 08 Ext. p. 85, Lesson 08 pp. 81-85, Lesson 09 pp. 87-93, Lesson 10 Ext. p. 100, Lesson 10 pp. 95-102, Lesson 11 Ext. pp. 107-108, Lesson 12 Ext. pp. 111-112, Lesson 12 pp. 109-116, Lesson 13 pp. 117-123, Lesson 14 pp. 125-134, Lesson 15 Ext. p. 142, Lesson 15 pp. 135-148, Lesson 16 Ext. pp. 152-153, Lesson 16 pp. 149-155, Lesson 17 pp. 157-160 **STC Elementary Literacy Series: Changes**: p. 13, pp. 04-07, pp. 22-27, pp. 28-29, pp. 30-33 **STC Elementary Literacy Series: Chemical Tests**: pp. 07-10, pp. 14-17 **KIDS DISCOVER: Changes**: pp. 1-15

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 3.P.3.1. Recognize that energy can be transferred from one object to another by rubbing them against each other.	**STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 03 Ext. pp. 34-35, Lesson 03 pp. 29-38, Lesson 08 Ext. p. 81, Lesson 08 pp. 77-84, Lesson 09 pp. 85-93, Lesson 10 pp. 95-103, Lesson 11 Ext. p. 112, Lesson 11 pp. 105-112, Lesson 12 pp. 113-119, Lesson 17 pp. 157-160 **STC Elementary Literacy Series: Motion and Design**: pp. 23-28

CONTENT AREA / STRAND NC.3.E.
Earth Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 3.E.1.1. Recognize that the earth is part of a system called the solar system that includes the sun (a star), planets, and many moons and the earth is the third planet from the sun in our solar system.	**STC Elementary 3rd Edition TG: Rocks and Minerals**: Lesson 06 pp. 43-49, Lesson 11 pp. 85-91 **STC Elementary Literacy Series: Rocks and Minerals**: pp. 39-41

CONTENT AREA / STRAND NC.3.E.
Earth Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 3.E.2.1. Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).	**STC Elementary 3rd Edition TG: Changes**: Lesson 02 pp. 21-30, Lesson 03 pp. 31-41 **STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 11 pp. 103-108 **STC Elementary 3rd Edition TG: Land and Water**: Appendix B pp. 197-199, Lesson 01 pp. 3-11, Lesson 02 pp. 13-31, Lesson 03 Ext. p. 40, Lesson 03 pp. 33-40, Lesson 04 Ext. pp. 48-49, Lesson 04 pp. 41-54, Lesson 06 pp. 65-78, Lesson 07 Ext. p. 84, Lesson 07 pp. 79-89, Lesson 08 Ext. pp. 99-100, Lesson 08 pp. 91-103, Lesson 09 Ext. p. 109, Lesson 09 pp. 105-113, Lesson 10 Ext. pp. 119-120, Lesson 10 pp. 115-123, Lesson 11 Ext. pp. 129-130, Lesson 11 pp. 125-132, Lesson 12 pp. 133-147, Lesson 13 Ext. p. 154, Lesson 13 pp. 149-157, Lesson 15 pp. 169-178, Lesson 17 pp. 189-191 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Lesson 08 pp. 59-65 **STC Elementary 3rd Edition TG: Soils**: Lesson 14 pp. 133-142, Lesson 15 pp. 143-151 **STC Elementary Literacy Series: Changes**: pp. 04-07 **STC Elementary Literacy Series: Land and Water**: pp. 21-25, pp. 30-31, pp. 41-44, pp. 50-52

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	STC Elementary Literacy Series: Rocks and Minerals: pp. 31-32 **KIDS DISCOVER: Earth**: pp. 1-19 **KIDS DISCOVER: Soil**: pp. 1-15 **KIDS DISCOVER: Water**: pp. 1-19
CLARIFYING OBJECTIVE 3.E.2.2. Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.	**STC Elementary 3rd Edition TG: Changes**: Lesson 13 pp. 115-124 **STC Elementary 3rd Edition TG: Land and Water**: Appendix B pp. 197-199, Lesson 01 Ext. p. 8, Lesson 01 pp. 3-11, Lesson 02 pp. 13-31, Lesson 06 Ext. pp. 70-71, Lesson 07 Ext. p. 84, Lesson 07 pp. 79-89, Lesson 08 Ext. pp. 99-100, Lesson 08 pp. 91-103, Lesson 09 Ext. p. 109, Lesson 09 pp. 105-113, Lesson 10 Ext. pp. 119-120, Lesson 10 pp. 115-123, Lesson 11 pp. 125-132, Lesson 14 pp. 159-168, Lesson 15 Ext. p. 174, Lesson 15 pp. 169-178, Lesson 16 Ext. p. 183, Lesson 16 pp. 179-188, Lesson 17 pp. 189-191 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Appendix A pp. 139-141, Lesson 03 Ext. p. 23, Lesson 03 pp. 19-26 **STC Elementary 3rd Edition TG: Sound**: Lesson 05 pp. 33-38 **STC Elementary Literacy Series: Changes**: pp. 22-27 **STC Elementary Literacy Series: Land and Water**: pp. 12-14, pp. 30-31, pp. 41-44, pp. 47-49, pp. 50-52 **STC Elementary Literacy Series: Rocks and Minerals**: pp. 28-30, pp. 47-49 **STC Elementary Literacy Series: Sound**: pp. 18-21 **KIDS DISCOVER: Earth**: pp. 1-19 **KIDS DISCOVER: Rocks**: pp. 1-19
CONTENT AREA / STRAND NC.3.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 3.L.1.1. Compare the different functions of the skeletal and muscular system.	**STC Elementary 3rd Edition TG: Animal Studies**: Lesson 13 Part 1 pp. 133-138
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Standards	**Titles That Meet**

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INDICATOR 3.L.2.1.a. Roots - absorb nutrients	**STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 01 Lit. p. 6, Lesson 03 Lit. p. 18, Lesson 10 pp. 55-61, Lesson 13 pp. 73-81 **STC Elementary 3rd Edition TG: Soils**: Lesson 09 pp. 87-95, Lesson 09 Ext. p. 93, Lesson 10 Ext. p. 103, Lesson 10 pp. 97-106, Lesson 11 pp. 107-111, Lesson 12 Ext. p. 118, Lesson 12 pp. 113-120, Lesson 13 pp. 121-131 **STC Elementary Literacy Series: Plant Growth and Development**: pp. 22-23, pp. 24-25 **STC Elementary Literacy Series: Soils**: pp. 12-13, pp. 14-17 **KIDS DISCOVER: Soil**: pp. 1-15
INDICATOR 3.L.2.1.b. Stems - provide support	**STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 01 Lit. p. 6, Lesson 07 pp. 39-42, Lesson 10 pp. 55-61, Lesson 13 pp. 73-81, Lesson 17 pp. 105-106 **STC Elementary Literacy Series: Plant Growth and Development**: pp. 22-23
INDICATOR 3.L.2.1.c. Leaves - synthesize food	**STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 01 Lit. p. 6, Lesson 06 Ext. p. 36, Lesson 06 pp. 33-37, Lesson 07 pp. 39-42, Lesson 10 pp. 55-61, Lesson 13 pp. 73-81, Lesson 17 pp. 105-106 **STC Elementary Literacy Series: Plant Growth and Development**: pp. 22-23
INDICATOR 3.L.2.1.d. Flowers - attract pollinators and produce seeds for reproduction	**STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 01 Lit. p. 6, Lesson 09 Lit. p. 51, Lesson 10 pp. 55-61, Lesson 11 pp. 63-68, Lesson 12 Ext. p. 71, Lesson 12 pp. 69-72, Lesson 13 pp. 73-81, Lesson 17 pp. 105-106 **STC Elementary Literacy Series: Plant Growth and Development**: pp. 22-23, pp. 39-41
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Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 3.L.2.2. Explain how environmental conditions determine how well plants survive and grow.	**STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 11 pp. 103-108 **STC Elementary 3rd Edition TG: Land and Water**: Lesson 14 Ext. p. 163 **STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 03 Ext. p. 18, Lesson 03 pp. 13-23, Lesson 04 Ext. p. 28, Lesson 04 Lit. p. 28, Lesson 04 pp. 25-28, Lesson 11 Lit. p. 66, Lesson 14 Lit. pp. 91-92, Lesson 15 Lit. p. 100, Lesson 17 pp. 105-106 **STC Elementary 3rd Edition TG: Soils**: Lesson 07 pp. 65-71, Lesson 09 pp. 87-95, Lesson 09 Ext. p. 93, Lesson 10 Ext. p. 103, Lesson 10 pp. 97-106, Lesson 11 pp. 107-111, Lesson 12 Ext.

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CLARIFYING OBJECTIVE 3.L.2.4. Explain how the basic properties (texture and capacity to hold water) and components (sand, clay and humus) of soil determine the ability of soil to support the growth and survival of many plants.	**STC Elementary 3rd Edition TG: Land and Water**: Lesson 14 Ext. p. 163 **STC Elementary 3rd Edition TG: Soils**: Appendix C pp. 173-174, Lesson 02 Ext. p. 24, Lesson 02 pp. 17-25, Lesson 04 pp. 37-43, Lesson 07 pp. 65-71, Lesson 07 Ext. pp. 69-70, Lesson 08 Ext. p. 80, Lesson 08 pp. 73-86, Lesson 11 pp. 107-111, Lesson 12 Ext. p. 118, Lesson 12 pp. 113-120, Lesson 13 Ext. p. 126-127, Lesson 13 pp. 121-131, Lesson 14 pp. 133-142, Lesson 15 Ext. p. 149, Lesson 15 pp. 143-151 **STC Elementary Literacy Series: Soils**: pp. 03-06, pp. 10-11, pp. 14-17, pp. 22-27, pp. 34-35 **KIDS DISCOVER: Soil**: pp. 1-15

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Grade 4

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 4.P.1.1. Explain how magnets interact with all things made of iron and with other magnets to produce motion without touching them.	**STC Elementary 3rd Edition TG: Electric Circuits**: Lesson 13 pp. 75-77 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Lesson 11 Ext. p. 87, Lesson 11 pp. 85-91, Lesson 13 pp. 101-104, Lesson 16 pp. 123-135, Lesson 17 pp. 137-138 **STC Elementary Literacy Series: Electric Circuits**: pp. 60-61
CLARIFYING OBJECTIVE 4.P.1.2. Explain how electrically charged objects push or pull on other electrically charged objects and produce motion.	**STC Elementary 3rd Edition TG: Electric Circuits**: Lesson 13 pp. 75-77 **STC Elementary Literacy Series: Electric Circuits**: pp. 60-61

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 4.P.2.1. Compare the physical properties of samples of matter: (strength, hardness, flexibility, ability to conduct heat, ability to conduct electricity, ability to be attracted by magnets, reactions to water and fire).	**STC Elementary 3rd Edition TG: Chemical Tests**: Appendix A pp. 161-162, Appendix B pp. 163-164, Lesson 01 pp. 3-13, Lesson 02 Ext. pp. 23-24, Lesson 02 pp. 15-24, Lesson 03 Ext. pp. 31-32, Lesson 03 pp. 25-37, Lesson 04 Ext. pp. 43-44, Lesson 04 pp. 39-47, Lesson 05 Ext. p. 55, Lesson 05 pp. 49-59, Lesson 06 Ext. pp. 65-66, Lesson 06 pp. 61-72, Lesson 07 Ext. p. 77, Lesson 07 pp. 73-80, Lesson 08 Ext. p. 85, Lesson 08 pp. 81-85, Lesson 09 pp. 87-93, Lesson 10 pp. 95-102, Lesson 11 Ext. pp. 107-108, Lesson 11 pp. 103-108, Lesson 12 Ext. pp. 111-112, Lesson 12 pp. 109-116, Lesson 13 pp. 117-123, Lesson 14 pp. 125-134, Lesson 15 Ext. p. 142, Lesson 15 pp. 135-148, Lesson 16 Ext. pp. 152-153, Lesson 16 pp. 149-155, Lesson 17 pp. 157-160 **STC Elementary 3rd Edition TG: Electric Circuits**: Appendix A pp. 93-94, Lesson 03 pp. 15-20, Lesson 04 pp. 21-25, Lesson 05 pp. 27-34, Lesson 07 Ext. p. 47, Lesson 07 pp. 43-47, Lesson 08 pp. 49-52, Lesson 09 Ext. p. 56, Lesson 09 pp. 53-56, Lesson 10 Ext. p. 60, Lesson 10 pp. 57-61, Lesson 11 Ext. pp. 66-67, Lesson 11 pp. 63-67, Lesson 13 pp. 75-77, Lesson 17 pp. 91-92 **STC Elementary 3rd Edition TG: Floating and Sinking**: Appendix B pp. 139-140, Lesson 16 Ext. p. 124, Lesson 16 pp. 121-127 **STC Elementary 3rd Edition TG: Food Chemistry**: Appendix A pp. 169-171, Lesson 09 Ext. p. 93, Lesson 09 pp. 87-95, Lesson 10 Ext. p. 100, Lesson 10 pp. 97-102, Lesson 11 pp. 103-109, Lesson 16 pp. 159-165 **STC Elementary 3rd Edition TG: Land and Water**: Lesson 11 pp. 125-132 **STC Elementary 3rd Edition TG: Microworlds**:

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	Lesson 08 Ext. p. 52, Lesson 08 pp. 47-52 **STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Appendix A pp. 139-141, Lesson 01 pp. 3-12, Lesson 02 pp. 13-17, Lesson 05 pp. 35-42, Lesson 07 Ext. p. 54, Lesson 10 Ext. p. 78, Lesson 10 pp. 75-83, Lesson 11 Ext. p. 87, Lesson 11 pp. 85-91, Lesson 13 pp. 101-104, Lesson 14 pp. 105-112, Lesson 15 Ext. p. 117, Lesson 15 pp. 113-121, Lesson 16 pp. 123-135, Lesson 17 pp. 137-138 **STC Elementary 3rd Edition TG: Sound**: Appendix B pp. 119-120, Lesson 01 Ext. p. 8, Lesson 01 pp. 3-9, Lesson 02 Ext. p. 15, Lesson 02 pp. 11-15, Lesson 03 Ext. p. 21, Lesson 03 pp. 17-22, Lesson 04 Ext. p. 26, Lesson 04 pp. 23-31, Lesson 05 Ext. p. 37, Lesson 08 pp. 59-68, Lesson 12 Ext. p. 88 **STC Elementary Literacy Series: Chemical Tests**: pp. 07-10, pp. 14-17 **STC Elementary Literacy Series: Electric Circuits**: pp. 07-10, pp. 11-12, pp. 13-16, pp. 60-61 **STC Elementary Literacy Series: Land and Water**: pp. 15-18 **KIDS DISCOVER: Rocks**: pp. 1-19 **KIDS DISCOVER: Water**: pp. 1-19
CLARIFYING OBJECTIVE 4.P.2.2. Explain how minerals are identified using tests for the physical properties of hardness, color, luster, cleavage and streak.	**STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 06 pp. 61-72 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Appendix A pp. 139-141, Lesson 01 pp. 3-12, Lesson 03 pp. 19-26, Lesson 04 pp. 27-33, Lesson 05 pp. 35-42, Lesson 06 Ext. p. 47, Lesson 06 pp. 43-49, Lesson 07 pp. 51-57, Lesson 08 pp. 59-65, Lesson 09 Ext. p. 70, Lesson 09 pp. 67-74, Lesson 10 Ext. p. 78, Lesson 10 pp. 75-83, Lesson 11 Ext. p. 87, Lesson 11 pp. 85-91, Lesson 12 Ext. p. 96, Lesson 12 pp. 93-99, Lesson 13 Ext. p. 103, Lesson 13 pp. 101-104, Lesson 14 Ext. p. 109, Lesson 14 pp. 105-112, Lesson 15 Ext. p. 117, Lesson 15 pp. 113-121, Lesson 16 Ext. p. 128, Lesson 16 pp. 123-135, Lesson 17 pp. 137-138 **STC Elementary Literacy Series: Rocks and Minerals**: pp. 13-16, pp. 17-19, pp. 20-22, pp. 36-38, pp. 42-44 **KIDS DISCOVER: Rocks**: pp. 1-19
CLARIFYING OBJECTIVE 4.P.2.3. Classify rocks as metamorphic, sedimentary or igneous based on their composition, how they are formed and the processes that create them.	**STC Elementary 3rd Edition TG: Land and Water**: Lesson 11 pp. 125-132 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Appendix A pp. 139-141, Lesson 01 Ext. p. 10, Lesson 01 pp. 3-12, Lesson 02 pp. 13-17, Lesson 03 pp. 19-26, Lesson 04 Ext. p. 31, Lesson 04 pp. 27-33, Lesson 05 Ext. p. 41, Lesson 05 pp. 35-42, Lesson 10 pp. 75-83,

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	Lesson 12 pp. 93-99, Lesson 16 Ext. p. 128, Lesson 16 pp. 123-135, Lesson 17 pp. 137-138 **STC Elementary Literacy Series: Land and Water**: pp. 15-18 **STC Elementary Literacy Series: Rocks and Minerals**: pp. 17-19, pp. 20-22, pp. 25-27, pp. 31-32, pp. 47-49, pp. 50-51 **KIDS DISCOVER: Rocks**: pp. 1-19
CONTENT AREA / STRAND NC.4.P. Physical Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 4.P.3.1. Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.	**STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 06 pp. 61-67, Lesson 07 Ext. p. 74, Lesson 07 pp. 69-76, Lesson 08 Ext. p. 81, Lesson 08 pp. 77-84, Lesson 09 pp. 85-93, Lesson 10 pp. 95-103, Lesson 11 Ext. p. 112, Lesson 11 pp. 105-112, Lesson 12 pp. 113-119, Lesson 17 pp. 157-160
CLARIFYING OBJECTIVE 4.P.3.2. Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.	**STC Elementary 3rd Edition TG: Microworlds**: Appendix C pp. 119-121 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Lesson 08 pp. 59-65, Lesson 09 pp. 67-74, Lesson 14 pp. 105-112, Lesson 15 Ext. p. 117, Lesson 15 pp. 113-121, Lesson 16 pp. 123-135, Lesson 17 pp. 137-138
CONTENT AREA / STRAND NC.4.E. Earth Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 4.E.1.1. Explain the cause of day and night based on the rotation of Earth on its axis.	**KIDS DISCOVER: Earth**: pp. 1-19
CONTENT AREA / STRAND NC.4.E. Earth Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 4.E.2.1. Compare fossils (including molds, casts, and preserved parts of plants and animals) to one another and to living organisms.	**STC Elementary 3rd Edition TG: Ecosystems**: Lesson 07 pp. 79-86 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Appendix A pp. 139-141, Lesson 02 Ext. p. 17, Lesson 02 pp. 13-17, Lesson 03 pp. 19-26, Lesson 08 pp. 59-65, Lesson 13 pp. 101-104 **STC Elementary Literacy Series: Ecosystems**: pp. 20-23 **STC Elementary Literacy Series: Rocks and Minerals**: pp. 33-35, pp. 47-49, pp. 52-54 **KIDS DISCOVER: Rocks**:

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	pp. 1-19
CLARIFYING OBJECTIVE 4.E.2.2. Infer ideas about Earth's early environments from fossils of plants and animals that lived long ago.	**STC Elementary 3rd Edition TG: Ecosystems**: Lesson 07 pp. 79-86 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Lesson 03 pp. 19-26, Lesson 08 pp. 59-65, Lesson 13 pp. 101-104 **STC Elementary Literacy Series: Ecosystems**: pp. 20-23 **STC Elementary Literacy Series: Rocks and Minerals**: pp. 33-35, pp. 47-49, pp. 52-54 **KIDS DISCOVER: Rocks**: pp. 1-19
CLARIFYING OBJECTIVE 4.E.2.3. Give examples of how the surface of the earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.	**STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 11 pp. 103-108 **STC Elementary 3rd Edition TG: Ecosystems**: Lesson 05 pp. 55-62 **STC Elementary 3rd Edition TG: Floating and Sinking**: Lesson 13 pp. 99-108 **STC Elementary 3rd Edition TG: Land and Water**: Appendix B pp. 197-199, Lesson 01 pp. 3-11, Lesson 03 Ext. p. 40, Lesson 03 pp. 33-40, Lesson 04 Ext. pp. 48-49, Lesson 04 pp. 41-54, Lesson 05 pp. 55-64, Lesson 06 Ext. pp. 70-71, Lesson 07 Ext. p. 84, Lesson 07 pp. 79-89, Lesson 09 Ext. p. 109, Lesson 09 pp. 105-113, Lesson 10 Ext. pp. 119-120, Lesson 10 pp. 115-123, Lesson 11 Ext. pp. 129-130, Lesson 11 pp. 125-132, Lesson 12 pp. 133-147, Lesson 13 Ext. p. 154, Lesson 13 pp. 149-157, Lesson 14 pp. 159-168, Lesson 15 Ext. p. 174, Lesson 15 pp. 169-178, Lesson 16 Ext. p. 183, Lesson 16 pp. 179-188, Lesson 17 pp. 189-191 **STC Elementary 3rd Edition TG: Microworlds**: Appendix C pp. 119-121 **STC Elementary 3rd Edition TG: Rocks and Minerals**: Lesson 01 pp. 3-12, Lesson 02 pp. 13-17, Lesson 03 Ext. p. 23, Lesson 03 pp. 19-26, Lesson 10 pp. 75-83, Lesson 15 pp. 113-121 **STC Elementary 3rd Edition TG: Sound**: Lesson 05 pp. 33-38, Lesson 16 pp. 111-114 **STC Elementary Literacy Series: Floating and Sinking**: pp. 48-50 **STC Elementary Literacy Series: Land and Water**: pp. 07-09, pp. 10-11, pp. 12-14, pp. 15-18, pp. 47-49, pp. 50-52 **STC Elementary Literacy Series: Rocks and Minerals**: pp. 07-09, pp. 17-19, pp. 25-27, pp. 28-30, pp. 47-49 **STC Elementary Literacy Series: Sound**: pp. 16-17, pp. 18-21 **KIDS DISCOVER: Earth**:

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	pp. 1-19 **KIDS DISCOVER: Ecology**: pp. 1-19 **KIDS DISCOVER: Oceans**: pp. 1-19 **KIDS DISCOVER: Rocks**: pp. 1-19 **KIDS DISCOVER: Water**: pp. 1-19
CONTENT AREA / STRAND NC.4.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 4.L.1.1. Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.	**STC Elementary 3rd Edition TG: Animal Studies**: Lesson 03 pp. 21-38, Lesson 05 Lit. p. 62, Lesson 06 Ext. p. 74, Lesson 06 pp. 69-78, Lesson 10 Ext. p. 110, Lesson 10 Lit. p. 110, Lesson 10 pp. 107-112, Lesson 11 Lit. p. 117, Lesson 12 Lit. p. 128, Lesson 14 Part 2 Lit. p. 142, Lesson 14 Part 2 pp. 139-151, Lesson 15 pp. 153-159, Lesson 16 Lit. p. 164 **STC Elementary 3rd Edition TG: Ecosystems**: Lesson 02 pp. 13-24, Lesson 03 pp. 25-38, Lesson 04 pp. 39-54, Lesson 05 pp. 55-62, Lesson 06 pp. 63-77, Lesson 07 Ext. pp. 83-84, Lesson 07 pp. 79-86, Lesson 08 pp. 87-100, Lesson 09 Ext. p. 103, Lesson 09 pp. 101-104, Lesson 10 Ext. p. 109, Lesson 10 pp. 105-115, Lesson 11 pp. 117-122, Lesson 12 pp. 123-130, Lesson 13 Ext. p. 134, Lesson 13 pp. 131-137, Lesson 14 pp. 139-152, Lesson 16 pp. 173-176, Lesson 17 pp. 177-179 **STC Elementary 3rd Edition TG: Land and Water**: Lesson 12 Ext. p. 138, Lesson 13 pp. 149-157 **STC Elementary Literacy Series: Animal Studies**: pp. 09-11, pp. 16-19, pp. 40-42, pp. 53-55, pp. 56-57 **STC Elementary Literacy Series: Chemical Tests**: pp. 35-38 **STC Elementary Literacy Series: Ecosystems**: pp. 11-13, pp. 17-19, pp. 20-23, pp. 28-30, pp. 31-34, pp. 35-37, pp. 45-48 **STC Elementary Literacy Series: Land and Water**: pp. 36-38 **KIDS DISCOVER: Earth**: pp. 1-19 **KIDS DISCOVER: Ecology**: pp. 1-19
CLARIFYING OBJECTIVE 4.L.1.2. Explain how animals meet their needs by using	**STC Elementary 3rd Edition TG: Animal Studies**: Appendix A pp. 169-170, Lesson 02 pp. 11-20, Lesson 03 Lit. p. 34,

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behaviors in response to information received from the environment.	Lesson 03 pp. 21-38, Lesson 04 Ext. p. 44, Lesson 04 Lit. p. 44, Lesson 04 pp. 39-50, Lesson 05 Ext. p. 62, Lesson 05 Lit. p. 62, Lesson 05 pp. 51-68, Lesson 06 Ext. p. 74, Lesson 06 Lit. p. 74, Lesson 06 pp. 69-78, Lesson 07 Ext. pp. 83-84, Lesson 07 Lit. p. 83, Lesson 07 pp. 79-90, Lesson 08 pp. 91-98, Lesson 09 Ext. p. 103, Lesson 09 pp. 99-105, Lesson 10 Ext. p. 110, Lesson 10 Lit. p. 110, Lesson 10 pp. 107-112, Lesson 12 Ext. p. 128, Lesson 12 Lit. p. 128, Lesson 12 pp. 121-132, Lesson 13 Part 1 Lit. p. 136, Lesson 14 Part 2 Lit. p. 142, Lesson 14 Part 2 pp. 139-151, Lesson 15 Ext. p. 156, Lesson 15 pp. 153-159, Lesson 16 Lit. p. 164 **STC Elementary 3rd Edition TG: Chemical Tests**: Lesson 12 pp. 109-116 **STC Elementary 3rd Edition TG: Ecosystems**: Lesson 02 pp. 13-24, Lesson 05 pp. 55-62, Lesson 06 Ext. p. 67, Lesson 06 pp. 63-77, Lesson 07 pp. 79-86, Lesson 08 pp. 87-100, Lesson 12 pp. 123-130, Lesson 13 Ext. p. 134, Lesson 13 pp. 131-137 **STC Elementary 3rd Edition TG: Microworlds**: Lesson 06 pp. 35-40, Lesson 14 Ext. p. 87, Lesson 14 pp. 83-87 **STC Elementary 3rd Edition TG: Motion and Design**: Lesson 04 pp. 39-50 **STC Elementary 3rd Edition TG: Plant Growth and Development**: Lesson 08 Ext. p. 45, Lesson 08 Lit. p. 45, Lesson 08 pp. 43-45, Lesson 09 Lit. p. 51, Lesson 09 pp. 47-53, Lesson 10 Lit. p. 57, Lesson 11 Lit. p. 66, Lesson 11 pp. 63-68, Lesson 12 Lit. p. 71, Lesson 13 Lit. p. 81, Lesson 14 Ext. pp. 91-92, Lesson 17 pp. 105-106 **STC Elementary 3rd Edition TG: Sound**: Lesson 04 pp. 23-31 **STC Elementary Literacy Series: Animal Studies**: pp. 06-08, pp. 09-11, pp. 12-15, pp. 16-19, pp. 22-25, pp. 30-32, pp. 40-42, pp. 53-55, pp. 56-57, pp. 58-61 **STC Elementary Literacy Series: Chemical Tests**: pp. 43-45 **STC Elementary Literacy Series: Ecosystems**: pp. 11-13, pp. 17-19 **STC Elementary Literacy Series: Microworlds**: pp. 40-43 **STC Elementary Literacy Series: Motion and Design**: pp. 12-13, pp. 14-17 **STC Elementary Literacy Series: Plant Growth and Development**: pp. 26-27, pp. 39-41, pp. 42-43, pp. 44-45 **STC Elementary Literacy Series: Sound**: p. 22, pp. 05-06, pp. 23-25 **KIDS DISCOVER: Bees**: pp. 1-19
CLARIFYING OBJECTIVE 4.L.1.3. Explain how humans can adapt their behavior to live in changing habitats (e.g., recycling	**STC Elementary 3rd Edition TG: Animal Studies**: Lesson 11 Ext. p. 117, Lesson 11 Lit. p. 117, Lesson 11 pp. 113-119, Lesson 13 Part 1 Ext. p. 136, Lesson 13 Part 1 pp. 133-138, Lesson 14

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wastes, establishing rain gardens, planting trees and shrubs to prevent flooding and erosion).	Part 2 Lit. p. 142
CLARIFYING OBJECTIVE 4.L.1.4. Explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats.	**STC Elementary 3rd Edition TG: Animal Studies**: Lesson 11 Lit. p. 117 **STC Elementary Literacy Series: Animal Studies**: pp. 45-49
CONTENT AREA / STRAND NC.4.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 4.L.2.1. Classify substances as food or non-food items based on their ability to provide energy and materials for survival, growth and repair of the body.	**STC Elementary 3rd Edition TG: Ecosystems**: Lesson 03 pp. 25-38, Lesson 04 pp. 39-54 **STC Elementary 3rd Edition TG: Food Chemistry**: Appendix A pp. 169-171, Lesson 05 pp. 51-58, Lesson 08 pp. 79-85, Lesson 09 pp. 87-95, Lesson 16 pp. 159-165 **STC Elementary Literacy Series: Ecosystems**: pp. 14-16 **KIDS DISCOVER: Nutrition**: pp. 1-19
CLARIFYING OBJECTIVE 4.L.2.2. Explain the role of vitamins, minerals and exercise in maintaining a healthy body.	**STC Elementary 3rd Edition TG: Food Chemistry**: Appendix A pp. 169-171, Lesson 01 pp. 3-9, Lesson 02 pp. 11-21, Lesson 03 pp. 23-37, Lesson 09 pp. 87-95, Lesson 14 pp. 129-135, Lesson 15 pp. 137-157, Lesson 16 Ext. p. 163, Lesson 16 pp. 159-165, Lesson 17 pp. 167-168 **STC Elementary Literacy Series: Food Chemistry**: pp. 11-12, pp. 51-54 **KIDS DISCOVER: Nutrition**: pp. 1-19

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Physical Science

Standards	Titles That Meet
CLARIFYING OBJECTIVE 5.P.1.1. Explain how factors such as gravity, friction, and change in mass affect the motion of objects.	**STC Elementary 3rd Edition TG: Floating and Sinking**: Lesson 04 pp. 29-35, Lesson 09 Ext. p. 70, Lesson 09 pp. 67-74, Lesson 17 pp. 129-131 **STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 03 Ext. pp. 34-35, Lesson 03 pp. 29-38, Lesson 04 Ext. p. 45, Lesson 04 pp. 39-50, Lesson 05 pp. 51-59, Lesson 08 Ext. p. 81, Lesson 08 pp. 77-84, Lesson 09 pp. 85-93, Lesson 10 pp. 95-103, Lesson 11 Ext. p. 112, Lesson 11 pp. 105-112, Lesson 12 pp. 113-119, Lesson 15 pp. 143-147, Lesson 17 pp. 157-160 **STC Elementary Literacy Series: Motion and Design**: pp. 23-28
CLARIFYING OBJECTIVE 5.P.1.2. Infer the motion of objects in terms of how far they travel in a certain amount of time and the direction in which they travel.	**STC Elementary 3rd Edition TG: Land and Water**: Lesson 07 pp. 79-89 **STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 04 Ext. p. 45, Lesson 04 pp. 39-50, Lesson 05 Ext. p. 55
CLARIFYING OBJECTIVE 5.P.1.3. Illustrate the motion of an object using a graph to show a change in position over a period of time.	**STC Elementary 3rd Edition TG: Motion and Design**: Lesson 04 pp. 39-50, Lesson 05 Ext. p. 55, Lesson 07 Ext. p. 74, Lesson 07 pp. 69-76, Lesson 09 Ext. pp. 91, Lesson 10 Ext. p. 100, Lesson 11 Ext. p. 112, Lesson 14 pp. 129-142, Lesson 17 pp. 157-160
CLARIFYING OBJECTIVE 5.P.1.4. Predict the effect of a given force or a change in mass on the motion of an object.	**STC Elementary 3rd Edition TG: Land and Water**: Lesson 07 pp. 79-89 **STC Elementary 3rd Edition TG: Motion and Design**: Appendix A pp. 161-162, Lesson 03 Ext. pp. 34-35, Lesson 03 pp. 29-38, Lesson 04 Ext. p. 45, Lesson 04 pp. 39-50, Lesson 05 pp. 51-59, Lesson 08 Ext. p. 81, Lesson 08 pp. 77-84, Lesson 09 pp. 85-93, Lesson 10 pp. 95-103, Lesson 11 Ext. p. 112, Lesson 11 pp. 105-112, Lesson 12 pp. 113-119, Lesson 17 pp. 157-160 **STC Elementary Literacy Series: Motion and Design**: pp. 23-28

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Standards	Titles That Meet
CLARIFYING OBJECTIVE 5.P.2.1. Explain how the sun's energy impacts the processes of the water cycle (including, evaporation, transpiration, condensation, precipitation and runoff).	**STC Elementary 3rd Edition TG: Land and Water**: Appendix B pp. 197-199, Lesson 02 Ext. p. 22, Lesson 02 pp. 13-31, Lesson 03 Ext. p. 40, Lesson 03 pp. 33-40, Lesson 14 Ext. p. 163, Lesson 17 pp. 189-191 **KIDS DISCOVER: Earth**: pp. 1-19 **KIDS DISCOVER: Ecology**: pp. 1-19

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CLARIFYING OBJECTIVE 5.P.2.3. Summarize properties of original materials, and the new material(s) formed, to demonstrate that a change has occurred.	**STC Elementary 3rd Edition TG: Food Chemistry**: Lesson 03 pp. 23-37, Lesson 04 Ext. p. 44, Lesson 04 pp. 39-49, Lesson 05 pp. 51-58, Lesson 06 Ext. p. 64, Lesson 06 pp. 59-68, Lesson 07 Ext. pp. 72-73, Lesson 07 pp. 69-77, Lesson 08 pp. 79-85, Lesson 12 Ext. pp. 117-118, Lesson 12 pp. 111-120, Lesson 13 pp. 121-128, Lesson 14 pp. 129-135, Lesson 16 pp. 159-165
CONTENT AREA / STRAND NC.5.P. Physical Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 5.P.3.2. Explain how heating and cooling affect some materials and how this relates to their purpose and practical applications.	**STC Elementary 3rd Edition TG: Food Chemistry**: Lesson 03 pp. 23-37, Lesson 04 Ext. p. 44, Lesson 04 pp. 39-49, Lesson 05 pp. 51-58, Lesson 06 Ext. p. 64, Lesson 06 pp. 59-68, Lesson 07 Ext. pp. 72-73, Lesson 07 pp. 69-77, Lesson 08 pp. 79-85, Lesson 09 Ext. p. 93, Lesson 09 pp. 87-95, Lesson 10 Ext. p. 100, Lesson 10 pp. 97-102, Lesson 11 pp. 103-109, Lesson 12 Ext. pp. 117-118, Lesson 12 pp. 111-120, Lesson 13 pp. 121-128, Lesson 14 pp. 129-135, Lesson 16 pp. 159-165
CONTENT AREA / STRAND NC.5.E. Earth Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 5.E.1.2. Predict upcoming weather events from weather data collected through observation and measurements.	**STC Elementary 3rd Edition TG: Land and Water**: Lesson 02 pp. 13-31, Lesson 03 pp. 33-40 **STC Elementary Literacy Series: Electric Circuits**: pp. 56-59 **STC Elementary Literacy Series: Land and Water**: pp. 57-58, pp. 59-61
CLARIFYING OBJECTIVE 5.E.1.3. Explain how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation.	**STC Elementary 3rd Edition TG: Floating and Sinking**: Lesson 13 pp. 99-108 **KIDS DISCOVER: Oceans**: pp. 1-19
CONTENT AREA / STRAND NC.5.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 5.L.1.1. Explain why some organisms are capable of surviving as a single cell while others require many cells that are specialized to survive.	**STC Elementary 3rd Edition TG: Microworlds**: Appendix C pp. 119-121, Lesson 11 Ext. p. 71, Lesson 11 pp. 67-72, Lesson 12 Ext. p. 76, Lesson 12 pp. 73-76, Lesson 13 Ext. p. 81, Lesson 13 pp. 77-81, Lesson 14 Ext. p. 87, Lesson 14 pp. 83-87, Lesson 15 pp. 89-93, Lesson 16 Ext. p. 98, Lesson 16 pp. 95-98, Lesson 17 pp. 99-100 **STC Elementary Literacy Series: Microworlds**: pp. 28-30, pp. 31-33, pp. 34-36 **KIDS DISCOVER: Microbes**: pp. 1-19

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CLARIFYING OBJECTIVE 5.L.1.2. Compare the major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, and cardiovascular) in terms of their functions necessary for life.	**STC Elementary 3rd Edition TG: Electric Circuits**: Lesson 06 pp. 35-41 **STC Elementary 3rd Edition TG: Food Chemistry**: Lesson 02 pp. 11-21, Lesson 03 pp. 23-37, Lesson 06 pp. 59-68, Lesson 07 pp. 69-77, Lesson 12 pp. 111-120 **STC Elementary 3rd Edition TG: Microworlds**: Lesson 02 pp. 9-14, Lesson 09 pp. 53-58 **STC Elementary Literacy Series: Electric Circuits**: pp. 53-55 **STC Elementary Literacy Series: Food Chemistry**: pp. 36-38, pp. 39-40, pp. 41-43 **STC Elementary Literacy Series: Microworlds**: pp. 56-57 **KIDS DISCOVER: Microbes**: pp. 1-19 **KIDS DISCOVER: Nutrition**: pp. 1-19
CONTENT AREA / STRAND NC.5.L. Life Science	
Standards	**Titles That Meet**
CLARIFYING OBJECTIVE 5.L.2.1. Compare the characteristics of several common ecosystems, including estuaries and salt marshes, oceans, lakes and ponds, forests, and grasslands).	**STC Elementary 3rd Edition TG: Animal Studies**: Lesson 01 Lit. p. 07, Lesson 02 pp. 11-20, Lesson 03 pp. 21-38, Lesson 04 Ext. p. 44, Lesson 04 Lit. p. 44, Lesson 04 pp. 39-50, Lesson 05 Lit. p. 62, Lesson 05 pp. 51-68, Lesson 06 Ext. p. 74, Lesson 06 Lit. p. 74, Lesson 06 pp. 69-78, Lesson 07 pp. 79-90, Lesson 08 pp. 91-98, Lesson 09 Ext. p. 103, Lesson 09 pp. 99-105, Lesson 11 Lit. p. 117, Lesson 12 Lit. p. 128, Lesson 14 Part 2 Ext. p. 142, Lesson 14 Part 2 Lit. p. 142, Lesson 15 Ext. p. 156, Lesson 15 pp. 153-159 **STC Elementary 3rd Edition TG: Ecosystems**: Lesson 02 pp. 13-24, Lesson 03 pp. 25-38, Lesson 04 Ext. p. 44, Lesson 04 pp. 39-54, Lesson 05 Ext. p. 60, Lesson 05 pp. 55-62, Lesson 06 Ext. p. 67, Lesson 06 pp. 63-77, Lesson 07 pp. 79-86, Lesson 09 pp. 101-104, Lesson 10 Ext. p. 109, Lesson 10 pp. 105-115, Lesson 11 pp. 117-122, Lesson 12 pp. 123-130, Lesson 13 Ext. p. 134, Lesson 13 pp. 131-137, Lesson 14 pp. 139-152, Lesson 15 pp. 153-171, Lesson 16 pp. 173-176, Lesson 17 pp. 177-179 **STC Elementary 3rd Edition TG: Floating and Sinking**: Lesson 10 pp. 75-81, Lesson 13 pp. 99-108, Lesson 14 Ext. p. 112, Lesson 14 pp. 109-112, Lesson 16 pp. 121-127 **STC Elementary 3rd Edition TG: Microworlds**: Lesson 06 pp. 35-40 **STC Elementary Literacy Series: Animal Studies**: pp. 06-08, pp. 09-11, pp. 16-19, pp. 30-32 **STC Elementary Literacy Series: Ecosystems**:

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	pp. 17-19, pp. 31-34 **STC Elementary Literacy Series: Floating and Sinking**: pp. 51-53, pp. 54-56, pp. 57-59, pp. 60-61 **STC Elementary Literacy Series: Microworlds**: pp. 40-43 **KIDS DISCOVER: Ecology**: pp. 1-19 **KIDS DISCOVER: Oceans**: pp. 1-19 **KIDS DISCOVER: Rain Forests**: pp. 1-19
CLARIFYING OBJECTIVE 5.L.2.2. Classify the organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers (biotic factors).	**STC Elementary 3rd Edition TG: Ecosystems**: Appendix B pp. 185-187, Lesson 03 pp. 25-38, Lesson 04 pp. 39-54, Lesson 05 pp. 55-62, Lesson 06 pp. 63-77, Lesson 07 pp. 79-86, Lesson 12 Ext. p. 127, Lesson 12 pp. 123-130, Lesson 13 Ext. p. 134, Lesson 13 pp. 131-137, Lesson 16 pp. 173-176, Lesson 17 pp. 177-179 **STC Elementary 3rd Edition TG: Microworlds**: Lesson 07 pp. 41-46, Lesson 15 pp. 89-93, Lesson 16 Ext. p. 98, Lesson 16 pp. 95-98, Lesson 17 pp. 99-100 **STC Elementary Literacy Series: Ecosystems**: pp. 14-16 **KIDS DISCOVER: Ecology**: pp. 1-19 **KIDS DISCOVER: Microbes**: pp. 1-19
CLARIFYING OBJECTIVE 5.L.2.3. Infer the effects that may result from the interconnected relationship of plants and animals to their ecosystem.	**STC Elementary 3rd Edition TG: Animal Studies**: Lesson 02 pp. 11-20, Lesson 03 pp. 21-38, Lesson 04 pp. 39-50, Lesson 05 Lit. p. 62, Lesson 05 pp. 51-68, Lesson 12 Lit. p. 128, Lesson 14 Part 2 Ext. p. 142, Lesson 14 Part 2 Lit. p. 142, Lesson 15 pp. 153-159 **STC Elementary 3rd Edition TG: Ecosystems**: Lesson 01 Ext. pp. 09-10, Lesson 01 pp. 03-12, Lesson 02 pp. 13-24, Lesson 03 pp. 25-38, Lesson 04 Ext. p. 44, Lesson 04 pp. 39-54, Lesson 05 Ext. p. 60, Lesson 05 pp. 55-62, Lesson 06 Ext. p. 67, Lesson 06 pp. 63-77, Lesson 07 Ext. pp. 83-84, Lesson 07 pp. 79-86, Lesson 08 pp. 87-100, Lesson 09 pp. 101-104, Lesson 10 Ext. p. 109, Lesson 10 pp. 105-115, Lesson 11 Ext. p. 120, Lesson 11 pp. 117-122, Lesson 12 Ext. p. 127, Lesson 12 pp. 123-130, Lesson 13 Ext. p. 134, Lesson 13 pp. 131-137, Lesson 14 pp. 139-152, Lesson 15 pp. 153-171, Lesson 16 Ext. p. 175, Lesson 16 pp. 173-176, Lesson 17 pp. 177-179 **STC Elementary 3rd Edition TG: Floating and Sinking**: Lesson 10 pp. 75-81, Lesson 14 pp. 109-112 **STC Elementary 3rd Edition TG: Microworlds**: Lesson 06 pp. 35-40, Lesson 08 pp. 47-52 **STC Elementary 3rd Edition TG: Motion and Design**: Lesson 09 Ext. pp. 91

TG- Teacher's Guide
Ext- Extension
Lit- Literacy

Grade 5	
	STC Elementary Literacy Series: Animal Studies: pp. 09-11, pp. 16-19 **STC Elementary Literacy Series: Ecosystems**: pp. 11-13, pp. 14-16, pp. 17-19, pp. 49-51 **STC Elementary Literacy Series: Floating and Sinking**: pp. 51-53, pp. 54-56 **STC Elementary Literacy Series: Microworlds**: pp. 16-19, pp. 40-43 **KIDS DISCOVER: Ecology**: pp. 1-19

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TG- Teacher's Guide
Ext- Extension
Lit- Literacy

PLTW Gateway Unit Descriptions

Design and Modeling
Students apply the design process to solve problems and understand the influence of creativity and innovation in their lives. Using Autodesk® design software, students create a virtual image of their designs and produce a portfolio to showcase their innovative solutions.

Automation and Robotics
Students trace the history, development, and influence of automation and robotics as they learn about mechanical systems, energy transfer, machine automation, and computer control systems. Students use the VEX Robotics® platform to design, build, and program real-world objects such as traffic lights, toll booths, and robotic arms.

App Creators
This unit exposes students to computer science as a means of computationally analyzing and developing solutions to authentic problems through mobile app development, and conveys the positive impact of the application of computer science to other disciplines and to society.

Computer Science for Innovators and Makers
Throughout the unit, students learn about programming for the physical world by blending hardware design and software development, allowing students to discover computer science concepts and skills by creating personally relevant, tangible, and shareable projects.

Energy and the Environment
Students are challenged to think big and toward the future as they explore sustainable solutions to our energy needs and investigate the impact of energy on our lives and the world. They design and model alternative energy sources and evaluate options for reducing energy consumption.

Flight and Space
The exciting world of aerospace comes alive through Flight and Space. Students explore the science behind aeronautics and use their knowledge to design, build, and test an airfoil. Custom-built simulation software allows students to experience space travel.

Science of Technology
Science impacts the technology of yesterday, today, and the future. Students apply the concepts of physics, chemistry, and nanotechnology to STEM activities and projects, including making ice cream, cleaning up an oil spill, and discovering the properties of nano-materials.

Magic of Electrons
Through hands-on projects, students explore electricity, the behavior and parts of atoms, and sensing devices. They learn knowledge and skills in basic circuitry design, and examine the impact of electricity on the world around them.

Green Architecture
Today's students have grown up in an age of "green" choices. In this unit, students learn how to apply this concept to the fields of architecture and construction by exploring dimensioning, measuring, and architectural sustainability as they design affordable housing units using Autodesk's® 3D architectural design software.

Medical Detectives
Students play the role of real-life medical detectives as they analyze genetic testing results to diagnose disease and study DNA evidence found at a "crime scene." They solve medical mysteries through hands-on projects and labs, investigate how to measure and interpret vital signs, and learn how the systems of the human body work together to maintain health.

Below is an example of how the VEX Robotics Course (offered as a middle school elective) addresses National Science, Mathematics, Technology, and Language Arts Standards. Created by Carnegie Mellon University's Robotics Academy, the curriculum is research-based, aligns with standards, and focuses on the development of 21st century skill sets in students. The full curriculum including lessons and assessments can be viewed at:
http://www.education.rec.ri.cmu.edu/content/curriculum/middle_school/index.htm
http://www.education.rec.ri.cmu.edu/roboticscurriculum/vex_online/

Systems, Order and Organization

Robots are excellent examples of systems, with many heterogeneous components interacting in organized, methodical ways to achieve results as a whole that they could not have achieved separately.
Examples include:

- Navigation systems (e.g. sensor tells the robot where it is, programmable controller tells the robot how to interpret this information, motors move in order to achieve the desired result)
- Sensing systems (electrical, mechanical, and programming elements of a sensor)
- Power & transmission systems (motor, axle, gear, wheel)
- Manipulator systems
- Lifting systems, vision systems, etc.

Each system can be broken down into subsystems.
Robotics technology is built upon a series of behaviors that can be measured mathematically and are understandable and predictable.
There are many examples that are easy for students to manipulate and understand:

- Gears and mechanical advantage
- Sensors and electronic control
- Wheel diameter and its effect on distance traveled
- Rotation sensor readings and robot path planning

Evidence, Models and Explanation

The investigations included in this curriculum allow students to collect evidence to investigate scientific principles. Robots physically demonstrate many scientific concepts to make them more clear and understandable.
Examples include:

- Electronics and basic circuitry, which can be demonstrated using touch sensors and the VEX power supply
- Light sensors, which can detect infrared as well as visible light.

Constancy, Change and Measurement

Robots rely on the use of many innate constants in their basic operation. Ultrasonic sensors, for instance, calculate distance based around an assumed value for the speed of sound.
In calculating the distance a robot travels per spin of its motor, fundamental mathematical relationships govern the elements of change and constancy between the different factors involved. For example, the ratio between the diameter and circumference of the wheel is constant ($C=\pi d$). On the other hand, a robot doesn't always need to use the same wheels – they can change – yet, no matter what the size of the wheel, the distance traveled per turn of the wheel remains proportional.

Measurement is fundamental to all aspects of robotics, from matching dimensions of parts to ensure that they can connect properly, to measuring how far your robot went, to measuring how well a prediction matched a result

Evolution and Equilibrium

Every robot design has a story. As they build and modify their robot designs, students can trace the evolution of their creation as they adapt it in different ways that allow it to complete different tasks, building upon lessons learned from their previous designs.
Equilibrium appears in many different forms as a design factor that students will encounter in designing their robots. For example, a robot's top speed is an equilibrium point between the physical force of friction and the force generated by the motor.

Form and Function

When designing robots, form always follows function.
Whether the design decision involves using large versus small wheels, making the motor power high versus low, or selecting the sensing device the robot will use, all decisions are based on what the robot is expected to do: its function. All of these decisions will affect the final shape of the robot: its form.

Science as Inquiry – Content Standard "A"

As a result of activities in all grades, all students should develop: • Abilities necessary to do scientific inquiry • Understanding about scientific inquiry Students should be engaged in activities that: • Begin with a question • Allow them to perform an investigation • Gather evidence • Formulate an answer to the original question • Communicate the investigative process and results	The guided investigations in Robotics Engineering are targeted at specific relevant questions about robotics technologies and concepts that lead to rich exploratory experiences. Some investigations focus on specific portions of the inquiry process, such as evidence-gathering or hypothesis evaluation. Others begin with a question and seek an answer using general inquiry processes. Explanation and evaluation are primary abilities applied in answering questions, not simply calculations or summarization.

Physical Science – Content Standard "B"

As a result of activities in all grades, all students should develop an understanding of: • Properties and changes of properties in matter • Motions and forces • Transfer of energy By using simple objects, such as rolling balls and mechanical toys, students can move from qualitative to quantitative descriptions of moving objects and begin to describe the forces acting on the objects. Understanding of energy will include light, heat, sound, electricity, magnetism, and the motion of objects.	Robotics is able to demonstrate many applied physical concepts. Here are a few examples: • Mechanical advantage (gears) • Basic circuitry (sensor operation) • Digital and analog electronics (sensors) • Light (lamp, light sensor) • Sound (ultrasonic, sound sensors) • Speed (motors) • Friction (robot movement) Quantitative measurement is a staple of all investigations.

Science and Technology – Content Standard "E"

As a result of activities in all grades, all students should develop: • Abilities in technological design • Understandings about science and technology Students should begin to differentiate between science and technology. In the middle school years, scientific investigations can be completed by activities in which the purpose is to meet a human need, solve a problem, or develop a product rather than explore ideas about the natural world.	Robotics is the premier example of the marriage of science and technology, especially as related to the solving of problems or human needs. Every investigation students conduct with the robot is motivated by the need to advance the performance of the robot in order to meet performance criteria, connecting the "need to know" with the "ability to do."

Mathematics Standards Addressed

From the National Council of Teachers of Mathematics (NCTM) Standards

Numbers and Operations

• Understand numbers, ways of representing number, relationships among numbers and number systems. • Understand meaning of operations and how they relate to one another. • Compute NCuently and make reasonable estimates.	Robotics uses numbers and operations in nearly all lessons, for example: • Calculating distance with rotational sensors (equations, equalities) • Gears, gear ratios and speed (ratios and proportions) • Light sensors and threshold (inequalities) • Wheel circumference, radius and diameter (geometric relationships)

Algebra

• Represent and analyze mathematical situations and structures using algebraic symbols. • Use mathematical models to represent and understand qualitative relationships. • Analyze change in various contexts.	Robotics lessons that involve algebra include the following: • Conditional statements (inequalities) • Programming sensors and thresholds (inequalities) • Measuring turns (equalities, solving equations) • Gears and speed (ratios, direct and indirect proportionality) • Passing parameters in functions

Geometry

• Precisely describe, classify, and understand relationships among types of two and three-dimensional objects using their defining properties. • Specify location and describe spatial relationships using coordinate geometry and other representational Systems.	Robotics situations involving geometry include: • Wheel rotations and circumference (diameter, circumference) • Identifying locations in order to program a robot to move from point to point (connected path segments) • Interlocking gears and gear ratios (discrete combinations of radii)

Measurement

• Understand measurable attributes of objects and the units, Systems, and processes of measurement. • Apply appropriate techniques, tools and formulas to determine measurements	Understanding the significance and meaning of measurements are central to the understanding of robotics: • Distance the robot travels (linear measurement, meter stick) • Amount a motor turns (angular measurement) • Directional change of the robot (angular measurement, protractor) • Speed of the robot (rate measurement, meter stick, built-in timer) • Physical quantities measured by sensors (touch, sound, light, distance)

	• Detectable region of a sensor (ultrasonic sensor, meter stick, 2D graph paper)

Problem- Solving

• Build new mathematical knowledge through problem solving. • Solve problems that arise in mathematics and other contexts. • Apply and adapt a variety of appropriate strategies to solve problems. • Monitor and reNCect on the process of problem solving	In the lessons, there are both guided and open-ended design problems that involve designing, building, and programming needed to create autonomous robots. • How do I get a robot to move a certain distance? (solved through measurement and the verification and use of a proportionality relationship) • What does the sound sensor measure? (solved by graphing the sensor readings with tones of varying volume and pitch, then seeing which one indicated an orderly relationship)

Reasoning and Proof

• Recognize reasoning and proof as fundamental aspects of mathematics. • Make and investigate mathematical conjectures. • Develop and evaluate mathematical arguments and proofs. • Select and use various types of reasoning and methods of proof.	Reasoning in robotics comes in many different forms, including the following: • Experimental reasoning, proof using measurements and physical evidence (Wheels and Distance) • Reasoning using equations, proof by solving (Measured Turns) • Reasoning about graphs, proof by observing trends (Frequency and Amplitude)

Communications

• Organize and consolidate their mathematical thinking through communications. • Communicate their mathematical thinking coherently and clearly to peers, teachers, and others. • Use the language of mathematics to express mathematical ideas precisely.	Each Activity and Investigation includes worksheet questions that require the student to reNCect on what they have accomplished or experienced, and describe it or some aspect of it in their own words to someone else. Emphasis is placed upon explaining reasoning in addition to showing calculations. The Engineering Design Challenge includes opportunities for students to communicate with their peers and teachers what they have learned and accomplished.

Connections

• Recognize and use connections among mathematical ideas. • Understand how mathematical ideas interconnect and build on one another to produce a coherent whole. • Recognize and apply mathematics in contexts outside of mathematics.	One of the strongest features of using robotics to teach math, science, engineering, technology and communications is its ability to make links between multiple disciplines. Students are able to take what they know and connect it to what they are learning, synthesizing new knowledge as they continue.

Technology Standards Addressed

From the International Technology Education Association (ITEA) Standards

The Nature of Technology

1. Students will develop an understanding of the characteristics and scope of technology. 2. Students will develop an understanding of the core concepts of technology. 3. Students will develop and understanding of the relationships among technologies and the connections between technology and other fields of study.	All robotics activities provide excellent hands-on exposure to technology in use and development. • Robotics activities feature linkages to advanced technology that allow students to connect their designs to real-world needs and solutions • Successful robot operation revolves around the application of Systems concepts to make sensors, actuators, and other components work together • Design processes take into account goals, resources, and trade-off factors to achieve optimal results • Technology exists in proper context alongside applications in science, math, and engineering • Several different technologies (e.g. desktop computer, USB/Bluetooth peripheral interface, mobile robotics controller, electromechanical sensors and actuators) are routinely used together in the operation of the VEX robot system, and all are necessary for it to work

Technology and Society

6. Students will develop an understanding of the role of society in the development and use of technology.	Robotics Engineering Design Challenges are linked to real world problems that use similar technologies to accomplish tasks that fulfill a social and/or economic need in the real world. For example: • For instance the orchard project and the automated workcell simulate problems that are being worked on in today's world. Some robot activities focus specifically on Human-Robot Interaction (HRI), an emerging field dealing specifically with psychological and design issues relating to the use of robots in human environments.

Design

8. Students will develop an understanding of the attributes of design 9. Students will develop and understanding of engineering design 10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem-solving.	Students gain first-hand experience with developing a functional robotic system in many activities, including: • The Orchard Project • The Hot Dog Maker • Automated Work Cell

Abilities for a Technological World

11. Students will develop the ability to apply the design process 12. Students will develop the ability to use and maintain technological products and systems	Students will apply design processes continually while working with and developing the robot. Here are some basic examples: • VEX competitions In the course of working with the robot, students will be responsible for the maintenance of their robots: • Mechanical soundness (the robot needs to be kept in good enough condition to perform its tasks daily) • Organizing information (students must keep good enough records to know how to use Systems they initially designed days or weeks earlier) • Troubleshooting (robots have problems– often– and students must be able to identify and solve these issues as they arise) Students will work with many important technologies as part of the operation of the VEX system: • VEX electronic microcontrollers • Desktop/laptop computer and software (VEX Programming Software, word processor for write ups, spreadsheets for data graphs) • Peripheral interfaces (USB or Bluetooth wireless) • Electromechanical systems (touch, light, rotation, sound, ultrasonic sensors) • Electromechanical actuators (Interactive Servo Motors)

The Designed World

- Students will develop an understanding of and be able to select and use energy and power technologies
- Students will develop an understanding of and be able to select and use information and communications technologies
- Students will develop an understanding of and be able to select and use transportation technologies
- Students will develop an understanding of and be able to select and use manufacturing technologies

Clemmons STEM Academy Draft Calendar

4 Independence Day

JULY 2016

S	M	T	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

29 First Day of school

AUGUST 2016

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	**29**	30	31			

5 Labor Day No School

SEPTEMBER 2016

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

28 First Quarter Ends -44 days
31 Teacher Planning and Conference Day No School

OCTOBER 2016

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	**31**					

11 Veterans Day
21-25 Thanksgiving Break No School
30 Early Release

NOVEMBER 2016

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	**21**	**22**	**23**	**24**	**25**	26
27	28	29	30			

16 Early Release
19-31 Winter Break No School

DECEMBER 2016

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	**19**	**20**	**21**	**22**	**23**	24
25	**26**	**27**	**28**	**29**	**30**	31

JANUARY 2017

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	**16**	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

2 School Resumes
16 M.L. King Day No School
24th Second Qtr Ends 45 days

FEBRUARY 2017

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	**17**	18
19	**20**	21	22	23	24	25
26	27	28				

17 Teacher wk day No School
20 Presidents' Day No School

MARCH 2017

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	**24**	25
26	27	28	29	30	31	

24th Teacher Workday No School
31st 3rd quarter ends 45 days

APRIL 2017

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	**10**	**11**	**12**	**13**	**14**	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

10-14 Spring Break No School

MAY 2017

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	**29**	30	31			

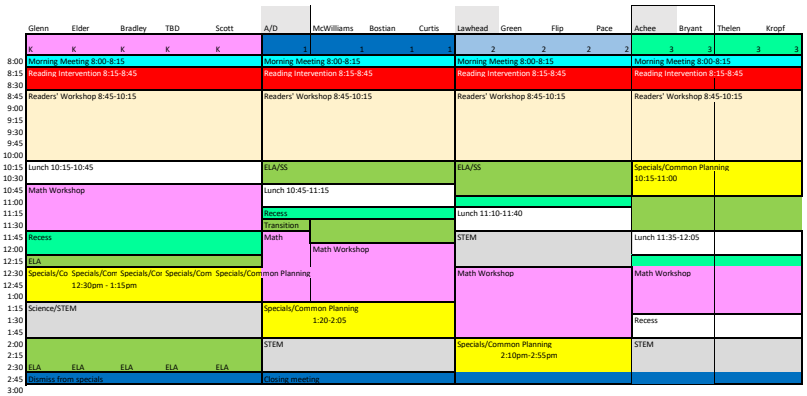
29 Memorial Day No School

JUNE 2017

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	**9**	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

9 4th Quarter Ends 44 Days

Total days 178
Total hours 1075


Glenn Elder Bradley TBD Scott A/D McWilliams Bostian Curtis Lawhead Green Flip Pace Achee Bryant Thelen Kropf
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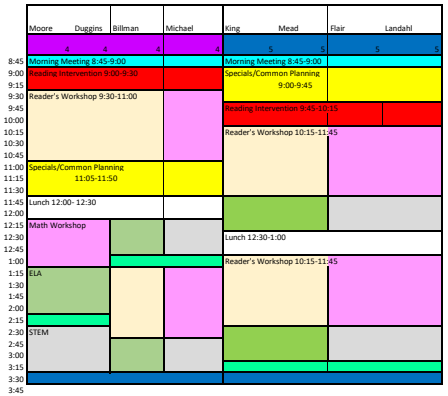
8:00 Morning Meeting 8:00-8:15
8:15 Reading Intervention 8:15-8:45
8:30
8:45 Readers' Workshop 8:45-10:15
9:00
9:15
9:30
9:45
10:00
10:15 Lunch 10:15-10:45
10:30
10:45 Math Workshop
11:00
11:15
11:30
11:45 Recess
12:00
12:15 ELA
12:30 Specials/Co Specials/Com Specials/Cor Specials/Com Specials/Common Planning
12:45 12:30pm - 1:15pm
1:00
1:15 Science/STEM
1:30
1:45
2:00
2:15
2:30 ELA ELA ELA ELA ELA
2:45 Dismiss from specials
3:00
Morning Meeting 8:00-8:15
Reading Intervention 8:15-8:45
Readers' Workshop 8:45-10:15
ELA/SS
Lunch 10:45-11:15
Recess
Transition
Math
Math Workshop
Specials/Common Planning
1:20-2:05
STEM
Closing meeting
Morning Meeting 8:00-8:15
Reading Intervention 8:15-8:45
Readers' Workshop 8:45-10:15
ELA/SS
Lunch 11:10-11:40
STEM
Math Workshop
Specials/Common Planning
2:10pm-2:55pm
Morning Meeting 8:00-8:15
Reading Intervention 8:15-8:45
Readers' Workshop 8:45-10:15
Specials/Common Planning
10:15-11:00
Lunch 11:35-12:05
Math Workshop
Recess
STEM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9:00 Reading Intervention 9:00-9:30
9:15
9:30 Reader's Workshop 9:30-11:00
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11:00 Specials/Common Planning
11:15 11:05-11:50
11:30
11:45 Lunch 12:00- 12:30
12:00
12:15 Math Workshop
12:30
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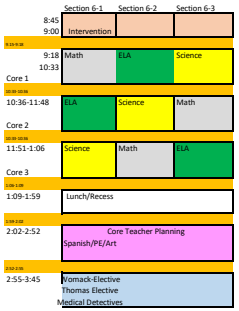
Morning Meeting 8:45-9:00
Specials/Common Planning
9:00-9:45
Reading Intervention 9:45-10:15
Reader's Workshop 10:15-11:45
Lunch 12:30-1:00
Reader's Workshop 10:15-11:45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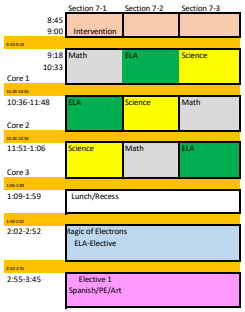
8:45
9:00 Intervention
9:18
10:33 Math ELA Science
Core 1
10:36-11:48 ELA Science Math
Core 2
11:51-1:06 Science Math ELA
Core 3
1:09-1:59 Lunch/Recess
2:02-2:52 Core Teacher Planning
Spanish/PE/Art
2:55-3:45 Nomack-Elective
Thomas Elective
Medical Detectives


Section 7-1 Section 7-2 Section 7-3
8:45
9:00 Intervention
9:18
10:33 Math ELA Science
Core 1
10:36-11:48 ELA Science Math
Core 2
11:51-1:06 Science Math ELA
Core 3
1:09-1:59 Lunch/Recess
2:02-2:52 Magic of Electrons
ELA-Elective
2:55-3:45 Elective 1
Spanish/PE/Art

	4	4	4	4	5	5	5	5
8:45	Reading 8:00-9:30				Reading 8:00-9:30			
9:00								
9:15								
9:30								
9:45								
10:00								
10:15	Math/Science Integrated				Recess			
10:30								
10:45					ELA			
11:00	Lunch							
11:15								
11:30					Lunch			
11:45								
12:00								
12:15								
12:30								
12:45	Recess							
1:00								
1:15	ELA							
1:30								
1:45					Specials/Common Planning 1:00-1:45			
2:00								
2:15								
2:30	Specials/Common Planning 1:50-2:35							
2:45								
3:00								
3:15	Developmental Play Centers							
3:30								
3:45								

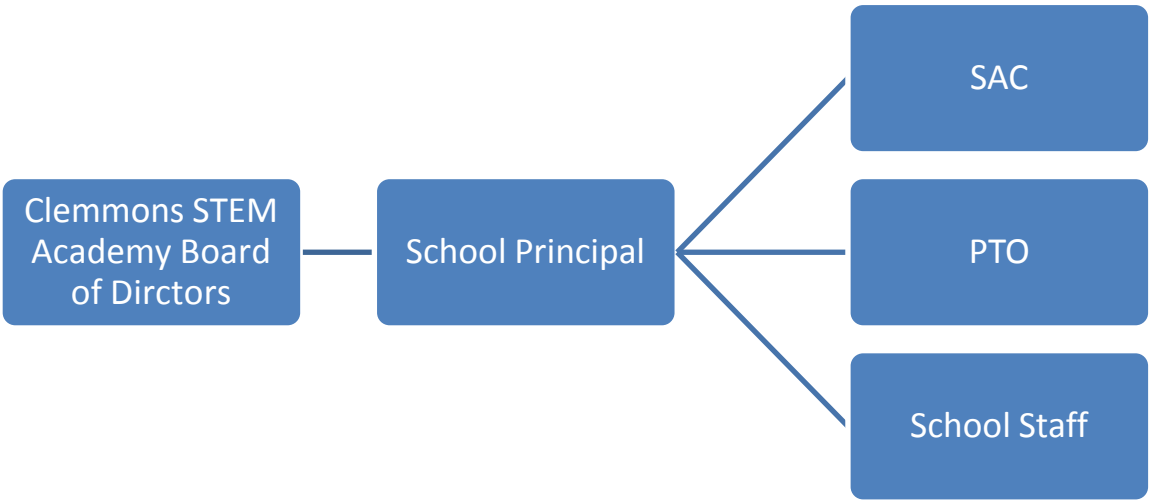
	Section 6-1	Section 6-2	Section 6-3
8:45 9:00	Intervnetion		
9:15-9:18			
9:18 10:33 Core 1	Math	ELA	Science
10:33-10:36			
10:36-11:48 Core 2	ELA	Science	Math
10:33-10:36			
11:51-1:06 Core 3	Science	Math	ELA
1:06-1:09			
1:09-1:59	Lunch/Recess		
1:59-2:02			
2:02-2:52	Core Teacher Planning Spanish/PE/Art		
2:52-2:55			
2:55-3:45	Womack-Elective Thomas Elective Medical Detectives		

	Section 7-1	Section 7-2	Section 7-3
8:45 9:00	Intervention		
9:15-9:18			
9:18 10:33 Core 1	Math	ELA	Science
10:33-10:36			
10:36-11:4 Core 2	ELA	Science	Math
10:33-10:36			
11:51-1:06 Core 3	Science	Math	ELA
1:06-1:09			
1:09-1:59	Lunch/Recess		
1:59-2:02			
2:02-2:52	Magic of Electrons ELA-Elective Science Elective		
2:52-2:55			
2:55-3:45	Elective 1 Spanish/PE/Art		

	Section 6-1	Section 6-2	Section 6-3
8:30-9:15	PE		
9:18-10:12	Science	Math	Soc. St.
10:15-11:09	Lab	Soc. St.	Math
11:12-12:06	Math	Science	LA
12:12-1:06	Soc. St.	Lab	Elec.
1:09-1:36	LUNCH		
1:39-2:33	Elec.	Math	Science
2:36-3:30	LA	Elec.	Lab

	Kindergarten				1st Grade				2nd Grade				3rd Grade				4th Grade		4th/5th			
Section→	Bradley	Achee	Scott	Glenn	Bostian	Duncan	Curtis	Flip	Green	Lawhead	Kropka	Parker	Austin	Thelen	Bryant	Kropf	Moore	Billman	Michael	Campbell	Odum	Duggins
Day↓																						
Day 1	PE	Arts	STEM	Music	PE	PE	Arts	STEM	PE	PE	Arts	STEM	PE	PE	Arts	STEM	PE	PE	PE	PE	Arts	STEM
Day 2	Arts	STEM	Music	PE	Arts	STEM	PE	PE	Arts	STEM	PE	PE	Arts	STEM	PE	PE	Arts	STEM	Arts	STEM	PE	PE
Day 3	STEM	Music	PE	Arts	PE	PE	STEM	Arts	PE	PE	STEM	Arts	PE	PE	STEM	Arts	PE	PE	PE	PE	STEM	Arts
Day 4	Music	PE	Arts	STEM	STEM	Arts	PE	PE	STEM	Arts	PE	PE	STEM	Arts	PE	PE	STEM	Arts	STEM	Arts	PE	PE

Clemmons STEM Academy Organizational Chart



Appendix F:

Charter School Board Member Information Form

Note: To be completed individually by each proposed founding charter school board member. All forms must be signed by hand.

Serving on a public charter school board is a position of public trust and as a board member of a North Carolina public charter school; you are responsible for ensuring the quality of the school's entire program, competent stewardship of public funds, and the school's fulfillment of its public obligations and all terms of its charter.

As part of the application for a new charter school, the State Board of Education requests that each prospective board member respond individually to this questionnaire. Where narrative responses are required, brief responses are sufficient.

The purpose of this questionnaire is twofold: 1) to give application reviewers a clearer introduction to the applicant team behind each school proposal in advance of the applicant interview, in order to be better prepared for the interview; and 2) to encourage board members to reflect individually as well as collectively on their common mission, purposes, and obligations at the earliest stage of school development.

Background

1. Name of charter school on whose Board of Directors you intend to serve: Clemmons STEM Academy

2. Full name: April M. Broadway

Home Address: P O Box 311, Bethania, NC 27010
Business Name and Address:
Telephone No.: 336-462-4169
E-mail address: nfinitygroup@gmail.com

3. Brief educational and employment history.
   I earned Bachelor of Science in Speech Pathology from Hampton University in Hampton Virginia, with advance training in Special Education from the University of North Carolina at Greensboro, a Master of Art in Middle Grades Education area of concentration in Science in Mathematics from Appalachian State University in Boone, North Carolina. I own and operate N-Finity Consulting, Inc. where I am the lead educational consultant.

4. Have you previously served on a board of a school district, another charter school, a non-public school or any not-for-profit corporation?

   No: ☐ Yes: X

5. How were you recruited to join this Board of Directors? Why do you wish to serve on the board of the proposed charter school?
   I was recruited to join this board by Eddie Goddall. I wish to serve on the board of this proposed charter school because I am very passionate about the charter school movement and more importantly STEM education.

6. What is your understanding of the appropriate role of a public charter school board member?
   My understanding of the appropriate role of a public charter school board member is to provide strategic vision for the school, hire leaders to run the school, hold those leaders accountable for the academic success, and to provide financial oversight.

7. Describe any previous experience you have that is relevant to serving on the charter school's board (e.g., other board service). If you have not had previous experience of this nature, explain why you have the capability to be an effective board member.
I have served in many capacities on several non-profit boards over the past 10 – 15 years. I have also consulted with a number of charter schools to provide board training.

8. Describe the specific knowledge and experience that you would bring to the board.
I bring a wealth of knowledge in the areas of non-profits, grant writing and compliance, curriculum, exceptional children and board governance. I have worked in and been a consultant to a number of charter school in the past 20 years.

School Mission and Program

1. What is your understanding of the school's mission and guiding beliefs?
My understanding of the school's mission and guiding beliefs is to provide a true STEM focused learning environment.

2. What is your understanding of the school's proposed educational program?
My understand is that we plan to implement a full integration of STEM including Legos, robotics, and hands on engineering for grades K-8.

3. What do you believe to be the characteristics of a successful school?
I believe the most important characteristics is a successful school is the leadership, evaluation, expectation, and a clear and precise direction.

4. How will you know that the school is succeeding (or not) in its mission?
As a board member I will know that the school is succeeding in it's mission by monitoring our leadership and student outcomes on an ongoing basis.

Governance

1. Describe the role that the board will play in the school's operation.
The role that the board will play in the school's operation is to ensure that we have efficient and effective leadership, to provide strategic direction, ensure the school is meeting it's mission, and provide financial oversight.

2. How will you know if the school is successful at the end of the first year of operation?
At the end of this first year we will determine the school's success through parent, teacher, and student surveys along with reviewing the information that is provided by the states accountability information. We will also use in house benchmark data to track student growth.

3. How will you know at the end of five years of the schools is successful?
The board will use it's Strategic Plan to determine success over time. With constant monitoring of the goals and mission we can make adjustments to ensure success.

4. What specific steps do you think the charter school board will need to take to ensure that the school is successful?
To ensure the school is successful the board will need to meet regularly and ensure commitment to the mission by board, leadership, staff, and parents.

5. How would you handle a situation in which you believe one or more members of the school's board were acting unethically or not in the best interests of the school?
   I would bring my concerns to the attention of the board chair if I believed that one or more members were acting unethically or not in the best interest of the school.

*Please include the following with your Information Form

- a ***one page*** resume
- a national criminal background check

*If you responded within the application that disciplinary action has been taken against any past or present professional licenses, provide a detailed response below outlining the disciplinary action taken and the license validity.

Certification

I, _April M Broadway_____, certify to the best of my knowledge and ability that the information I am providing to the North Carolina State Board of Education as a prospective board member for __Clemmons STEM Academy_____ Charter School is true and correct in every respect.

APBroadway 09/17/2017

Signature Date

Appendix F:

Charter School Board Member Information Form

Note: *To be completed individually by each proposed founding charter school board member. All forms must be signed by hand.*

Serving on a public charter school board is a position of public trust and as a board member of a North Carolina public charter school; you are responsible for ensuring the quality of the school's entire program, competent stewardship of public funds, and the school's fulfillment of its public obligations and all terms of its charter.

As part of the application for a new charter school, the State Board of Education requests that each prospective board member respond individually to this questionnaire. Where narrative responses are required, brief responses are sufficient.

The purpose of this questionnaire is twofold: 1) to give application reviewers a clearer introduction to the applicant team behind each school proposal in advance of the applicant interview, in order to be better prepared for the interview; and 2) to encourage board members to reflect individually as well as collectively on their common mission, purposes, and obligations at the earliest stage of school development.

Background

1. Name of charter school on whose Board of Directors you intend to serve: **Clemmons STEM Academy**

2. Full name: **Charles Eldridge Mellies**

Home Address: **943 Marguerite Drive, Winston-Salem, NC 27106**
Business Name and Address: **Dummit Fradin Attorneys at Law**
Telephone No.: **(336) 837-5482**
E-mail address: **Mellies@dummitfradin.com**

3. Brief educational and employment history.
   Wake Forest University School of Law, Juris Doctor, 2011
   Wake Forest University, Bachelor of Arts in Political Science and Sociology, 2008

   Dummit Fradin Attorneys at Law, Criminal Defense Attorney and Sports Agent, 2014-Present
   Forsyth County Public Defender's Office, Assistant Public Defender, 2011-2013

4. Have you previously served on a board of a school district, another charter school, a non-public school or any not-for-profit corporation?

   No: ☒ Yes: ☐

5. How were you recruited to join this Board of Directors? Why do you wish to serve on the board of the proposed charter school?

   Linda Petrou, former Assistant Professor at Wake Forest University, invited me to join the board because she believes my experience as an attorney and former public defender will make me an excellent contributor. I wish to serve on the board because it will be an ideal opportunity to learn how to guide a school towards success. I also desire to pay forward an excellent education to others like people who came before me provided to me.

6. What is your understanding of the appropriate role of a public charter school board member?

Unlike administrators who manage the day-to-day mechanics of the school, a board member's role is to view and examine the overall picture and determine how accurately the school is achieving its mission. If it is not close, the board must debate and agree on how policies should be implemented in favor towards the mission. If it is close, the board seeks gaps and offers ways the school can improve itself.

7. Describe any previous experience you have that is relevant to serving on the charter school's board (e.g., other board service). If you have not had previous experience of this nature, explain why you have the capability to be an effective board member.

Although I have no experience teaching or working in a charter school, I believe I am capable of being an invaluable board member. My current occupation as an attorney, experience in public defense and military service is unique to the board. My experience and education has given me the discipline to diligently work towards goals, and I can take matters into further consideration from a legal perspective which will be very important as we guide the development of this school.

8. Describe the specific knowledge and experience that you would bring to the board.

As mentioned previously, my current occupation as an attorney will enable me to view matters from a legal perspective that can save the school from serious legal consequences under our leadership.

School Mission and Program

1. What is your understanding of the school's mission and guiding beliefs?

The school's mission is to provide each student a quality STEM education effectively preparing them for careers in math, engineering, technology, and the sciences.

2. What is your understanding of the school's proposed educational program?

We are especially excited about implementing a full integration of STEM including Legos robotics and hands-on engineering for grades K-8.

3. What do you believe to be the characteristics of a successful school?

I believe a STEM education, a civics education component, and a dedicated board are characteristics of a successful school. First, in a world that is constantly and quickly advancing in technology, it is especially important that we prepare the next generation with tools to succeed in careers in science, technology, and math. The Academy can achieve this by reaching students at an early age to help them build problem-solving skills and articulate their strategies and solutions. Second, a civics component is also crucial these days. I would like to see the Academy make efforts to revitalize civics education, give students the tools they need to be great citizens, and better understand the country they live in. Finally, a dedicated board is one of the most important characteristics to a successful school. The board sets the standard for the principal, teachers, parents, and students, and it must follow through in upholding the Academy's mission every day.

4. How will you know that the school is succeeding (or not) in its mission?

Scheduled benchmark assessments, scheduled staff meetings, parent-teacher conferences, and regular teacher classroom visits by the administration will help us determine the school's progress toward the mission.

Governance

1. Describe the role that the board will play in the school's operation.

The board is an overseer that relies on the mission statement as the capital landmark in the school's journey. It evaluates operations on a high-level and preserves the long-term success of the school.

2. How will you know if the school is successful at the end of the first year of operation?

At the end of the Academy's first year, we will evaluate EOC results of state according to the data produced by the NCDPI. We anticipate performance to exceed the state average the first year especially in math and science, and seek to maintain the standard to exceed the average in all subjects in future years.

3. How will you know at the end of five years of the schools is successful?

Based on the school's performance over a five-year period, we expect to achieve certain objectives as outlined by the NCDPI. Those results will enable us to immediately identify and act upon our strengths and weaknesses.

4. What specific steps do you think the charter school board will need to take to ensure that the school is successful?

The board should begin by agreeing upon what realistic goal(s) they want the school to achieve by the end of the first or second year. Then, the board should help supply the school with the necessary capital to foster development and advancement. Finally, as the school year progresses, the board should continuously check the performance of the school through the ways mentioned in question 4 under school mission. The board should be honest with itself about its strengths and weaknesses and find ways to take advantage of those strengths and weaknesses to reach its goals.

5. How would you handle a situation in which you believe one or more members of the school's board were acting unethically or not in the best interests of the school?

If a member of the board were to act unethically against the best interests of the school, I would call a special closed session in which all board members must be present. During this session, we will examine the facts, express our insight to each other, and handle the matter as delicately and authoritatively as possible.

*Please include the following with your Information Form

- a ***one page*** resume
- a national criminal background check

*If you responded within the application that disciplinary action has been taken against any past or present professional licenses, provide a detailed response below outlining the disciplinary action taken and the license validity.

Certification

I, **Charlie Mellies**, certify to the best of my knowledge and ability that the information I am providing to the North Carolina State Board of Education as a prospective board member for **Clemmons STEM Academy** Charter School is true and correct in every respect.

DocuSigned by:
Charlie Mellies
6[illegible]D...

Signature

9/20/2017

Date

Appendix F:

Charter School Board Member Information Form

Note: *To be completed individually by each proposed founding charter school board member. All forms must be signed by hand.*

Serving on a public charter school board is a position of public trust and as a board member of a North Carolina public charter school; you are responsible for ensuring the quality of the school's entire program, competent stewardship of public funds, and the school's fulfillment of its public obligations and all terms of its charter.

As part of the application for a new charter school, the State Board of Education requests that each prospective board member respond individually to this questionnaire. Where narrative responses are required, brief responses are sufficient.

The purpose of this questionnaire is twofold: 1) to give application reviewers a clearer introduction to the applicant team behind each school proposal in advance of the applicant interview, in order to be better prepared for the interview; and 2) to encourage board members to reflect individually as well as collectively on their common mission, purposes, and obligations at the earliest stage of school development.

Background

1. Name of charter school on whose Board of Directors you intend to serve: **Clemmons STEM Academy**

2. Full name: **Courtney Savin Ageon**

Home Address: 3805 Bridlington Drive Greensboro, NC 27455
Business Name and Address: LBA Haynes Strand, PLLC
Telephone No.: 336-286-3204
E-mail address: cageon@triad.rr.com

3. Brief educational and employment history.
   B.S. and M.S. in Accounting from UNC-Greensboro
   17 years at LBA Haynes Strand PLLC as Tax manager/senior accountant

4. Have you previously served on a board of a school district, another charter school, a non-public school or any not-for-profit corporation?

   No: ☐ Yes: ☒

5. How were you recruited to join this Board of Directors? Why do you wish to serve on the board of the proposed charter school?
   A partner with my firm, who works closely with charter schools, was made aware of a need for a CPA on the board for a new STEM Charter school. I want to serve on this because I am passionate about charter schools in general, but also the STEM curriculum.

6. What is your understanding of the appropriate role of a public charter school board member?
   A public charter school board member's role is to help the principal, teachers, and staff meet the academic growth and other goals set forth for the school. A board member must also be an example for the principal, teachers, students, and parents by upholding the school's mission both inside and outside the school.

7. Describe any previous experience you have that is relevant to serving on the charter school's board (e.g., other board service). If you have not had previous experience of this nature, explain why you have the capability to be an effective board member.
I have served on other nonprofit boards so I understand the importance and responsibility that goes along with being a board member. I also have experience with nonprofits in general through my work as a CPA. I am very passionate about Charter Schools and their impact on the community, as both my children attend a Charter School.

8. Describe the specific knowledge and experience that you would bring to the board.
As mentioned above, I have worked with nonprofits as a board member, as an auditor, and in assisting with tax compliance. I believe I can be of great help with financial reporting and tax compliance matters. I also believe drawing on my experiences as a current parent of students at a charter school will be a good resource to the board as well.

School Mission and Program

1. What is your understanding of the school's mission and guiding beliefs?
My understanding is that Clemmons STEM Academy's mission is to promote high academic achievement through a STEM workshop model that empowers students to take ownership of their learning. Students will be able to grow and improve at their own pace.

2. What is your understanding of the school's proposed educational program?
STEM focused workshop model that will allow students to grow at their own individual pace. This program will prepare students for not only high school and college but also successful careers.

3. What do you believe to be the characteristics of a successful school?
I believe passionate educators and a dedicated board are important characteristics of a successful school. A board and staff that have a common vision and understanding of the goals set forth for the school are essential. Finally, a supporting learning environment that also focuses on social responsibility is also very important to be a successful school.

4. How will you know that the school is succeeding (or not) in its mission?
As a board, we must monitor enrollment and attrition closely. Attrition is an indicator of success in our mission. We must monitor annual goals for academics closely as well as behavioral issues, which can be an indicator of teachings related to social responsibility.

Governance

1. Describe the role that the board will play in the school's operation.
The board will be charged with setting goals for the school that are based on the school's mission and vision. We will also be responsible for annual budgets and assisting with hiring and maintaining passionate staff members.

2. How will you know if the school is successful at the end of the first year of operation?
Success will be determined by the school meeting the goals the board, which include growth and attrition expectations. I would also believe reviewing and responding to parent feedback is essential.

3. How will you know at the end of five years of the schools is successful?
I believe key indicators will be enrollment numbers, teacher satisfaction, as well as determining if the school has met the first five year goals set.

4. What specific steps do you think the charter school board will need to take to ensure that the school is successful?
   The board must meet regularly and be actively engaged with the staff as well as parents. We must ensure the school has a principal ready to take the lead and a passionate well trained staff.

5. How would you handle a situation in which you believe one or more members of the school's board were acting unethically or not in the best interests of the school?
   If the behavior is a major concern, I would approach the board's chair and make sure that all facts are gathered. If the behavior was of a minor concern, I would approach the board member individually and address my concerns with him/her directly.

*Please include the following with your Information Form

- a ***one page*** resume
- a national criminal background check

*If you responded within the application that disciplinary action has been taken against any past or present professional licenses, provide a detailed response below outlining the disciplinary action taken and the license validity.

Certification

I, Courtney Agean, certify to the best of my knowledge and ability that the information I am providing to the North Carolina State Board of Education as a prospective board member for Clemmons STEM Academy Charter School is true and correct in every respect.

Signature 9/16/2017 Date

Appendix F:

Charter School Board Member Information Form

Note: *To be completed individually by each proposed founding charter school board member. All forms must be signed by hand.*

Serving on a public charter school board is a position of public trust and as a board member of a North Carolina public charter school; you are responsible for ensuring the quality of the school's entire program, competent stewardship of public funds, and the school's fulfillment of its public obligations and all terms of its charter.

As part of the application for a new charter school, the State Board of Education requests that each prospective board member respond individually to this questionnaire. Where narrative responses are required, brief responses are sufficient.

The purpose of this questionnaire is twofold: 1) to give application reviewers a clearer introduction to the applicant team behind each school proposal in advance of the applicant interview, in order to be better prepared for the interview; and 2) to encourage board members to reflect individually as well as collectively on their common mission, purposes, and obligations at the earliest stage of school development.

Background

1. Name of charter school on whose Board of Directors you intend to serve: Clemmons STEM Academy

2. Full name: Linda L. Petrou

Home Address: 1324 Berwick Road, Wnston-Salem, NC 27103
Business Name and Address: Retired
Telephone No.: 336-287-6405
E-mail address: lindapetrou@gmail.com

3. Brief educational and employment history. I graduated from the University of Maryland with three degrees: a BA (1987) in American History with Honors, a MA (1990) in Comparative Politics and a Ph.D. (1994) in Comparative Politics/subfield Soviet Foreign Policy. I thought Political Science for over ten years at High Point University then taught Communications for several years at Wake Forest University. In addition I also taught Political Science at FTCC for a number of years. In all I have taught from 1988-2015. I also had the pleasure of working with the Washington Center for Internship and Seminars as Faculty during 3 National Conventions, about 10 January Seminars in Washington and three summer seminars. During this period I was also Administrative Director of a U.S. Department of State grant that was housed at Wake Forest University. While at the University of Maryland I was also the Director of the Soviet-East European Archives and of the East-South Project. Before attending college as a non-traditional student I spent a number of years in Washington, D.C. working for a congressman, at SmithKline Corporation's Washington office, the Aluminum Association and with various other organizations both political and nonpolitical.

4. Have you previously served on a board of a school district, another charter school, a non-public school or any not-for-profit corporation?

   No: ☐X Yes: ☐

5. How were you recruited to join this Board of Directors? Why do you wish to serve on the board of the proposed charter school? I received a call from State Senator Joyce Krawiec asking me if I would be

interested in participating and I immediate said yes. Right after that, I received a call from Eddie Goodall who went into further detail. I agreed to be a member of the board and to help establish this STEM Academy.

6. What is your understanding of the appropriate role of a public charter school board member? My understanding of a public charter school board member comes from my service on a previous public board. We are not micromanagers but rather directors in the sense we establish policy and leave the day to day running of the charter school to the principals and teachers. We have a duty to oversee what they do to ensure they are following the mission of the school and the charter. We also need to lead by example and show that we also are following the mission of the school and the charter.

7. Describe any previous experience you have that is relevant to serving on the charter school's board (e.g., other board service). If you have not had previous experience of this nature, explain why you have the capability to be an effective board member. I served for 9 years (3 - 3 year terms) on the Forsyth County Board of Health from 2007-20016. I became Vice Chair in 2009 and Chair of the Board in 2010 and remained in that position until the end of my term. During this period we had to replace the Health Director which required a nation-wide search and several rounds of interviews until we made our decision. We set the policy for the Department of Health but delegated to the Health Director and staff the day to day responsibilities of running the Department. We also dealt with oversight on the Department's budget, the fee structure for services, the creation of a Dental Clinic, the creation of several new programs dealing with infant mortality and held public hearings before setting policy. In addition, we were tasked with holding hearings dealing with complaints from the public. I also was appointed by Mayor Woods in 1997 to serve on the Winston Salem Sister Cities exploratory committee. Once we drew up the charter, the bylaws, selected possible cities to partner with we then were officially established by the City Council and I then served for a number of years on the Winston Salem Sister Cities Board.

8. Describe the specific knowledge and experience that you would bring to the board. As mentioned in the previous question I have had experience in leading an established Board and helping to found a new Board. Both of those experiences will help me in the creation and maintenance of a new charter school. While the functions are different a board member must be able to work and lead others, must be able to inspire and encourage board members and staff and must be able to set goals and accomplish them. Having oversight of this type requires patience and understanding and the ability to lead with a firm hand.

School Mission and Program

1. What is your understanding of the school's mission and guiding beliefs? The school's mission is to educate the students in four specific disciplines - science, technology, engineering and math in an interdisciplinary approach. It is to provide the student with a opportunity to become an academically thriving citizen with a basis of knowledge to either continue in college or to obtain a job in the STEM field.

2. What is your understanding of the school's proposed educational program? The Clemmons STEM Academy will have as its primary focus, as it's name indicates, an education paradigm based on STEM (Science, Technology, Engineering and Math). STEM is based on the notion that students should be educated in four specific disciplines - science, technology, engineering and math. But this education is not one based on teaching these four subjects separately and discretely but rather as an integrated cohesive paradigm based on real world applications. It is estimated that by 2018 the bulk of the STEM jobs will be in the area of computing, technology, physical science, life science and math. we are no longer an

economy based solely on manufacturing therefore we need to educate our students in such a way that they will be prepared for their future.

1. What do you believe to be the characteristics of a successful school? The most important characteristics of a successful school goes far beyond the end of grade testing results. A successful school is one in which the students, teachers, administrators and community members create a culture where creativity and inquiry exists which engages the students in innovation and problem solving to seek solutions and teamwork. Students learn in different ways; by creating an atmosphere where they work together in a project-based approach that makes real world connections.

2. How will you know that the school is succeeding (or not) in its mission? There are several measurements of success. The first, of course, would be the end of grade scores. If within the first year the scores remain the same or improve that would be a success. This would become the baseline of measurement. Success would be increasing those baseline numbers every year. Another measurement of success would be a stable attrition rate for both students and teachers. The first year will be vital in establishing an atmosphere in which both student and teachers can succeed. If we start to lose students and/or teachers then I would consider us a failure. The school will have to meet its yearly targets set for all subjects not just reading and math. We, as a Board, have to set high expectations for everyone involved. I have seen studies that indicate that students drop out of school because they are bored. We have been teaching down to the lowest common denominator instead of set high standards for the students to meet. As former President George W. Bush, in a speech in 1999 citing equal education as central to civil rights, said that poor and minority children are the ones who suffer when accountability is weakened, He went on to say "I fear that the soft bigotry of low expectations is returning, and for the sake of America's children, that is something we cannot allow...Whatever difficulties we face, they will not be addressed by weakening accountability." If we set high standards and they are met we will be successful.

Governance

1. Describe the role that the board will play in the school's operation. The Board will set the goals and the mission for the school. We will be responsible for establishing a budget and hiring of responsible staff that will buy into the mission of the school. We will then turn over the day-to-day governing of the school to that staff. Only if there is a problem will we step in. We will retain oversight.

2. How will you know if the school is successful at the end of the first year of operation? If the goals that are set are met, if the end of grade testing is on a par with or exceeding other schools, if students and teachers and parents are happy with the progress being achieved, if we retain students and teachers (minus normal attrition) and if we have delivered the curriculum we set out to provide.

3. How will you know at the end of five years of the schools is successful? If we achieve the goals that we set out, if our enrollment numbers are high, if teachers and parents are satisfied with the outcomes and if the community feels we are successful.

4. What specific steps do you think the charter school board will need to take to ensure that the school is successful? The Board will need to be a unified entity that meets on a regular basis. We will need to set high but achievable goals for the first year and ensuing years. We will need to hire a principal who is fully vested with the STEM philosophy and who wants to make a difference. They must be enthusiastic

so that they can lead a team equally enthusiastic teachers. The boards should be themselves vested in and a part of the school, attending events and visiting several times a year. Each of us have our own area of expertise so perhaps a board teaching day might be an idea. They said the secret to life is just showing up; so we should be willing to show up.

5. How would you handle a situation in which you believe one or more members of the school's board were acting unethically or not in the best interests of the school? First of all I would talk to the individual involved, not in an accusatory way, but in a sincere attempt to find out what is happening. I also would go to the chair to give them a heads up of what is happening. I also would make sure that the attorney was aware of the problem. If there is no change in a short period of time(depending upon the situation) then I would request the chair convene an Executive Board Meeting with the attorney present to discuss the problem and solve it. The Board is the face of the Clemmons STEM Academy. If we appear to condone misbehavior then that will have a negative and dilatory impact on the school.

*Please include the following with your Information Form

- a ***one page*** resume
- a national criminal background check

*If you responded within the application that disciplinary action has been taken against any past or present professional licenses, provide a detailed response below outlining the disciplinary action taken and the license validity.

Certification

I, Linda L. Petrou, certify to the best of my knowledge and ability that the information I am providing to the North Carolina State Board of Education as a prospective board member for Clemmons STEM Academy Charter School is true and correct in every respect.

Signature

9/17/17

Date

Appendix F:

Charter School Board Member Information Form

Note: *To be completed individually by each proposed founding charter school board member. All forms must be signed by hand.*

Serving on a public charter school board is a position of public trust and as a board member of a North Carolina public charter school; you are responsible for ensuring the quality of the school's entire program, competent stewardship of public funds, and the school's fulfillment of its public obligations and all terms of its charter.

As part of the application for a new charter school, the State Board of Education requests that each prospective board member respond individually to this questionnaire. Where narrative responses are required, brief responses are sufficient.

The purpose of this questionnaire is twofold: 1) to give application reviewers a clearer introduction to the applicant team behind each school proposal in advance of the applicant interview, in order to be better prepared for the interview; and 2) to encourage board members to reflect individually as well as collectively on their common mission, purposes, and obligations at the earliest stage of school development.

Background

1. Name of charter school on whose Board of Directors you intend to serve: Clemmons STEM Academy

2. Full name: Jonathan Scott Cumbie

Home Address: 140 Mayfield Rd, Winston-Salem, NC 27104
Business Name and Address: Dynamix, 140 Mayfield Rd, Winston-Salem, NC 27104
Telephone No.: (336) 782-1590
E-mail address: Scott@ScottCumbie.com

3. Brief educational and employment history.

Bachelor of Arts, Systems Science – Business
Dynamix - 2012 – 2017 – Systems Architect and Engineer
Wachovia / Wells Fargo – 2002 – 2012 – Storage Architect
VF Corportation – 2000 – 2002 – Manager, Systems and Storage Management
USAir – 1994 – 2000 – Storage Admininstrator

4. Have you previously served on a board of a school district, another charter school, a non-public school or any not-for-profit corporation?

   No: ☒ Yes: ☐

5. How were you recruited to join this Board of Directors? Why do you wish to serve on the board of the proposed charter school?
   I was recruited by another Board member. I gave some consideration to starting a charter schools approximately 10 years ago.

6. What is your understanding of the appropriate role of a public charter school board member?
   To oversee the operations and affairs of the charter school.

7. Describe any previous experience you have that is relevant to serving on the charter school's board (e.g., other board service). If you have not had previous experience of this nature, explain why you have the capability to be an effective board member.
   My career has been spent in Information Technology with a heavy emphasis on applying Information Technology to business problems. My business experience and IT experience will be useful as a board member.

8. Describe the specific knowledge and experience that you would bring to the board.
   Business and Information Technology experience

School Mission and Program

1. What is your understanding of the school's mission and guiding beliefs?
   The schools mission is to provide a STEM education for each student

2. What is your understanding of the school's proposed educational program?
   The primary focus is on STEM

3. What do you believe to be the characteristics of a successful school?
   A school should not only provide knowledge but instill critical thinking skills in each student

4. How will you know that the school is succeeding (or not) in its mission?
   If the students are scoring above average in standardized tests and are competing well with other STEM schools.

Governance

1. Describe the role that the board will play in the school's operation.
   Oversight of the school, financial and academic

2. How will you know if the school is successful at the end of the first year of operation?
   If the students are scoring above average in standardized tests

3. How will you know at the end of five years of the schools is successful?
   Students successfully competing with other STEM schools and are succeeding in higher grade levels and college.

4. What specific steps do you think the charter school board will need to take to ensure that the school is successful?
   Develop of complete curriculum
   Hiring talented teachers
   Providing the correct resources for students and teachers
   Creating an environment that promotes learning and critical thinking

5. How would you handle a situation in which you believe one or more members of the school's board were acting unethically or not in the best interests of the school?
   One on one discussions with the member and closed discussions with the entire board, if necessary.
   Consulting with school's legal counsel if the matter is not is not resolved.

*Please include the following with your Information Form

- a ***one page*** resume

- a national criminal background check

*If you responded within the application that disciplinary action has been taken against any past or present professional licenses, provide a detailed response below outlining the disciplinary action taken and the license validity.

Certification

I, Jonathan Scott Cumbie, certify to the best of my knowledge and ability that the information I am providing to the North Carolina State Board of Education as a prospective board member for Clemmons STEM Academy Charter School is true and correct in every respect.

DocuSigned by:
Scott Cumbie
Signature: [illegible]473...

Signature

9/20/2017

Date

April Michelle Broadway

P. O. Box 311
Bethania, NC 27010
Business Mobile: (336) 462-4169
President & CEO
N-Finity Consulting, Inc.

Education

M.A. in Middle Grades Education Appalachian State University, *Boone, NC, 2001*
B.S. in Speech and Language Pathology, Hampton University, *Hampton, VA, 1988*

Certifications

Qualified Mental Health Professional, 2001

Relevant Experience

President, **N-Finity Consulting, Inc.**, Winston-Salem, NC June 2005-Present

Regional Testing and Compliance Coordinator, Exceptional Children Compliance Officer/Internal Controls, **Carter G. Woodson School**, Winston-Salem, NC February 2014 – June 2014

Interim Executive Director, **Smart Start of Forsyth County** December 2011 – June 2012

Resource Development & Compliance Officer/Internal Controls (**Torchlight Academy Charter School, and Cape Lookout Marine Science High School,)** January 2011 – Present

Chief Operating Officer, **Community Resource Solutions LLC,** Gaston, NC September 2007 – February 2010

Co-Director of Guidance and Counseling, **Carter G. Woodson School**, Winston-Salem, NC
August 2004- June 2006

Assistant Dean of Admissions, **Salem College**, Winston-Salem, NC July 2003- July 2005

Academic Advisor, **University Of North Carolina-Greensboro**, Greensboro, NC, January 2003 – June 2003

Professional Activities

Girls Scouts Peaks to Piedmont USA Board of Directors (2011- Present)
Mental Health Association of the Triad Board of Directors (2011- Present)
Chair Smart Start of Forsyth County Board (2010 – 2012)
Financial Pathways of the Piedmont (formerly Consumer Credit Counseling Board (2010 – Present))
Alumni Council Board, National Hampton Alumni Association, Inc. (2009 – Present)
President North Carolina Region of the National Hampton Alumni Association (2011- Present)
1st Vice President North Carolina Region of the National Hampton Alumni Association (2008 –2011)

Charles Mellies

charliemellies@gmail.com
943 Marguerite Dr., Winston-Salem, NC 27106
(336) 837-5482

Education

Wake Forest University School of Law, Winston-Salem, North Carolina
Juris Doctor 2011

- National Trial Team Member (competed in National Finals in 2010 & 2011)
- Robert Goldberg Award Recipient in Trial Advocacy and Ethics
- Army ROTC Scholarship recipient

Wake Forest University, Winston-Salem, North Carolina
Bachelor of Arts in Political Science and Sociology, *Cum laude* 2008

- Wake Forest University Baseball Team Captain (2006 - 2008)
- Atlantic Coast Conference All-Academic Team (2006 & 2008)
- Two-year President of Student Athlete Advisory Committee
- Member of Omicron Delta Kappa National Leadership Society

Work Experience

Dummit Fradin Attorneys at Law, *Winston-Salem, NC* 2014 – Present
Criminal Defense Attorney and Sports Agent

- Lead counsel in misdemeanor and felony cases from investigation through jury verdict
- Recruited, evaluated and retained clients daily
- Taught Continuing Legal Education Classes throughout North Carolina
- Mentored young attorneys and law students from Wake Forest

Forsyth County Public Defender's Office 2011 – 2013
Assistant Public Defender

- Defended indigent clients on general misdemeanors and felonies
- Represented clients in jury trials from Breaking and Entering to First Degree Murder
- Active case load of 220+ cases

Legal Intern 2009 – 2011

- Conducted jury and bench trials in domestic violence, DWI, and embezzlement cases

United States Army Reserves 2011 – Present
CPT – 81st Regional Support Command

- Officer in Judge Advocate General Corps
- Former Executive Officer for 1/323 B Co. and JA for 134th Legal Operations Detachment

Candidate for Clerk of Superior Court, *Forsyth County* 2014

- Researched and contacted potential donors and key voting areas
- Managed volunteers, fundraising, events, and website development

Candidate for NC House of Representatives Dist. 72 2012

- Campaigned throughout community including televised debate and candidate forums
- In charge of campaign finance and reporting, fundraising, and website development

BarBri Bar Exam Preparation 2008 - 2011
Head Student Account Representative

- Managed team of 11 law student representatives
- In charge of meeting preparation, inventory, and account maintenance

Calvary Baptist Day School, *Winston-Salem, NC* 2011 – 2012
Assistant Varsity Baseball Coach

- Increased win total by 300% in second year and led team to state playoffs
- Assisted two players in receiving baseball scholarships to Gardner Webb University

Bar Membership **North Carolina State Bar #43061** 2011 - Present
Security Clearance **Secret** 2010 - Present

Volunteer Experience

Santa's Helper Board of Directors, Winston-Salem, NC 2008 - Present
Operation Wounded Soldier at Walter Reed Army Medical Center 2007- 2008

3805 Bridlington Drive
Greensboro, NC 27455
336-337-3234
cageon@lbahs.com

Courtney Ageon, CPA

Professional Experience

2000 - Present LBA Haynes Strand, PLLC Greensboro, NC

Tax Manager/Senior Staff Accountant

- Supervise and train associates
- Manage and build client relationships
- Prepare and review tax returns for individuals, businesses, retirement plans, and exempt organizations
- Research and provide guidance on tax laws and regulations
- Plan and perform financial audits of small business and employee benefit plans

Volunteer Experience

2013 - Present Greensboro Historical Museum, Inc. Greensboro, NC

Treasurer/Assistant Treasurer/Trustee

2013 - Present Summerfield Charter Academy Summerfield, NC

Parent Council Committee Treasurer

2014 - Present Greyhound Friends of North Carolina, Inc. Oak Ridge, NC

Kennel Volunteer

Education

1997 - 2002 UNC-Greensboro Greensboro, NC

- B.S. in Accounting
- M.S. in Accounting

Certifications and Affiliations

Certified Public Accountant, November 2003
Member, North Carolina Association of CPA's
Member, American Institute of CPA's
Member, Society of Financial Service Professionals

Curriculum Vitae

Linda L. Petrou, Ph.D.

1324 Berwick Road
Winston-Salem, NC 27103
(336) 287-6405
E-mail: lindapetrou@gmail.com
Facebook: LindaPetrou

EDUCATION:

- Ph.D.: Comparative Politics, 1994, University of Maryland, College Park
- M.A.: Comparative Politics, 1990, University of Maryland, College Park
- B.A.: With Honors: History, 1987, University of Maryland, College Park

BOARD MEMBERSHIP

- Governor's Advisory Council on Aging 2017-present
- Forsyth County Board of Health, 2007-2016 - Vice Chair, 2009-10; Chair, 2010 to 2016
- Winston-Salem Sister Cities Board, 1997-2007

TEACHING EXPERIENCE

- Tutor – Fall 2011-Fall 2015 – Athletic Services, Wake Forest University
- Visiting Assistant Professor – Fall 2005 to Spring 2011, Wake Forest University.
- Adjunct Professor –Fall 2005 to Fall 2015. Forsyth Tech Community College,
- Adjunct Professor – Summer 2004-Spring 2005. Wake Forest University.
- Assistant Professor -- 1999 to 2004. High Point University
- Adjunct Professor -- 1994-1999. High Point University
- Instructor -- 1990-1992. University of Maryland, College Park
- Teaching Assistant -- 1988-1990. University of Maryland, College Park,

PROGRAM DEVELOPMENT AND MANAGEMENT

- Administrative Director, Summer 2006-2013. Wake Forest University and the Benjamin Franklin Transatlantic Fellows Initiative: Summer Institute for Youth. U.S. Department of State Grant
- Program Coordinator, Summer 2006. Wake Forest University and (South East Europe Youth Leadership Institute. Grant received from the U.S. Department of State. .
- Director, Soviet-East European Archives and Assistant, East-South Project, 1987-1992University of Maryland,

BUSINESS EXPERIENCE

- Program Administrator, National Heritage Program, Maryland Department of Natural Resources, 1987-1989
- Assistant to the VP, The Aluminum Association, Washington, D.C, 1977-1983
- Executive Assistant, SmithKline Corporation, Washington, D.C., 1973-1977
- Assistant, Tufty & Associates, Washington, D.C. 1971-1973
- Receptionist/Secretary, The Honorable Robert J. Corbett, R.Pa (deceased), Washington, D.C., 1966-1971

Jonathan Scott Cumbie

140 Mayfield Rd.
Winston-Salem, NC 27104
(336) 765-9290 - Home, (336) 782-1590 - Cell

EMPLOYMENT HISTORY

Dynamix: Nov 2012 - Present:

Systems Architect for the Data Protection and Software Define Storage practices **Wells Fargo / Wachovia Bank: Jan 2002 – Nov 2012t:**

Lead architect for implementation of an 8,000 client multi-PB TSM environment
Strategic Planning
Introduction of NetBackup and Avamar products with Wells Fargo merger
Backup servers: AIX, Linux & Solaris
Clients: iSeries, AIX, Solaris, HP-UX, Linux, Windows, zSeries USS DB2, Oracle, Informix, SQL Server, Teradata, Lotus Domino, Exchange

VF Services: Mar 1998 - Nov 2001:

Manager, Systems / Storage Management
Strategic Planning
Re-architected the OS/390 Storage Management practices
Implemented OS/390 SMS-managed tape
Implemented TSM and backup/recovery strategy for open systems environment
Implemented SAN infrastructure for open systems environment
Implementation of Systems Management practices on OS/390 and Open Systems:
SA/390 & Tivoli TEC/DM/Software Distr/Inventory/Remote Control OS/390 Systems Programming

US Airways / The Sabre Group: Nov 1994 - Mar 1998:

Lead architect for OS/390 / MVS Storage Management
Strategic Planning
Implemented TSM for Open Systems Storage environment
Implemented MQSeries across OS/390 and Opens Systems environments

FORMAL EDUCATION

Bachelor of Arts, Systems Science/Business:
University of West Florida, Pensacola, FL
Major: Systems Science/Business Minor: Management
Minor: Management

Associate of Arts, Computer Science:
Pensacola Junior College, Pensacola, FL
Major: Computer Science

Bylaws of Clemmons STEM Academy, Inc.

(Modeled after Alliance Preparatory Schools, INC dba Mallard Creek STEM Academy)

ARTICLE I ORGANIZATION

I.1 Name: This corporation shall be known as Clemmons STEM Academy, Inc. (the "Corporation"). The charter school shall operate under the corporation as Clemmons STEM Academy.

I.2 Principal Office: The Corporation's principal office, known place of business and place where its records shall be kept, will be located in Union County, North Carolina or such other place as designated by the Board of Directors.

I.3 Registered Office: The registered office of the Corporation required by law to be maintained in the State of North Carolina may be, but not need to be, identical with the principal office.

I.4 Other Offices: The Corporation may have offices at such other places, as the Board of Directors may from time to time determine, or as the affairs of the corporation may require.

I.5 Corporate Seal: No instrument executed by or on behalf of the Corporation shall require a corporate seal for validity, but if a corporate seal is used, the Board of Directors shall approve them.

I.6 Fiscal year: The fiscal year of the Corporation shall begin on the first day of July and end on the last day of June next succeeding.

I.7 Registered Agent: The name and address of the Corporation's registered agent is W.E. Goodall, Jr 2132 Greenbrook PKWY Weddington NC 28104

ARTICLE II PURPOSE

II.1 Purpose: The sole and exclusive purpose of the Corporation shall be to establish and operate a Charter School under the Charter School Act of 1996, as codified in North Carolina Statues 115C-238.29A et seq.

ARTICLE III MEMBERS

III.1 Members: There shall be no members of this non-profit Corporation.

ARTICLE IV BOARD OF DIRECTORS

IV.1 General Powers: All corporate powers shall be exercised by or under the authority of, and the business and affairs of the Corporation shall be manage by, the Board of Directors or by such committees as the Board of Directors may establish pursuant to these by laws.

IV.2 Number and Term: The Board of Directors shall consist of a minimum of five (5) and a maximum of nine (9) Directors. The actual number of Directors shall be determined from time-to-time at the discretion of the board. Directors shall serve for terms of three years, or until their successors assume office. Board seats shall have staggered terms such that 1/3 of the positions expire each year. Directors may serve for a maximum of two consecutive terms with a one-term waiting period required before being eligible for re-election.

IV.3 Election: The Board members shall be elected by a majority vote of the Board of Director's members, or by such committees as the Board of Directors may establish pursuant to these bylaws.

IV.4 Composition: Employees of the Corporation eligible to receive benefits and contractors employed by the Corporation shall not be eligible to serve as Board of Director's members. Members of the Board of Directors should also not be related to one another. At all times the Board of Directors' membership should strive to reflect the diversity of the school community.

IV.5 Authority: The powers of the Board of Directors shall include, without limitation, the authority to do the following:

IV.5.1 Appointments: Appoint, remove, replace and supervise all the Corporation's officers and any of the Corporation's employees.

IV.5.2 Investments: Invest and expend Corporation funds in order to execute the Corporation's business.

IV.5.3 Agents: Employ or discharge agents, employees and independent contractors

IV.5.4 Agreements: Negotiate and enter into agreements, subcontracts, and develop and conduct the Corporation's business and otherwise execute the Corporation's intent and purpose.

IV.5.5 Insurance: Obtain liability, property and other insurance necessary to protect the Corporation's assets, business and properties, as well as the Corporation's officers, Directors, managers, and employees.

IV.5.6 Litigation: Execute litigation on collection matters for payments due to the Corporation for services rendered by or arranged by the Corporation.

IV.5.7 Borrowing: Borrow money for Corporation purposes.

IV.5.8 Documents: Execute instruments or documents necessary to carry out Corporation business.

IV.5.9 Procedures: Establish procedures, policies, and guidelines for the Corporation which shall be implemented and followed by the Corporation's officers, employees, and independent contractors.

IV.6 Policies and Procedures: The Board of Directors shall be authorized from time to time to adjust, amend and repeal policies and procedures as it may deem necessary or appropriate to govern the Corporation's operations.

IV.7. Action by the Board of Directors: A majority vote is required for the Board of Directors to act or take action upon decisions.

IV.8 Compensation: Unless otherwise expressly provided by resolution by the Board of Directors, no Director shall receive any compensation for his or her services as Director. From time to time, members of the Board of Directors shall be compensated or reimbursed for actual expenses, if any, for services rendered and approved in the name of the Corporation, by majority vote of The Board of Directors.

IV.9. Committees: The Board of Directors may establish, from time to time and at its discretion, committees to accomplish the goals and objectives of the Corporation and its programs. Such committees shall have such responsibilities as the Board of Directors shall specify. Committees may include, but are not limited to Executive, Finance, Personnel, Facility, Curriculum, Fundraising, Enrollment, Expulsion or others as needed. Members of the committees may be removed by the Board of Directors, with or without cause.

IV.10 Vacancies: Any vacancy on the Board of Directors shall be filled by a majority vote of the remaining members of the Board of Directors at any meeting.

IV.11 Resignations: Any Director may resign at any time by giving written notice of his or her resignation to the Corporation. Such resignations shall take effect at the time specified therein. If the time when it shall become effective is not specified therein, it shall take effect immediately upon its receipt by the Chair of the Secretary, and unless otherwise specified, the acceptance of such resignation shall not be necessary to make it effective.

IV.12 Director Responsibilities: All Directors will be required to demonstrate commitment to the Corporation and its missions & purpose to Clemmons STEM Academy. Directors will be required to attend meetings of the Boards of Directors and accept committee memberships. Directors consecutively absent from three (3) meetings of the Board of Directors, or one-half of the regular meetings within one (1) fiscal year, without reasonable cause for such absences, may be removed from the Board of Directors.

IV.13 Time Requirements: Nothing in the bylaws requires that a person serving on the Board of Directors spend his or her full time or any specific amount of time managing the Corporation's business. However, any person serving as a Director shall be available at reasonable times to assist and serve in the business of the Corporation.

IV.14 Removal From The Board of Directors: A Director member may be removed with or without cause only by a simple majority vote of the Board of Directors at any meeting. Directors will be considered for dismissal for any one the following breaches of integrity, including violation of confidentiality, undermining the directives of the Board, being indicted or convicted of a felony, failing to oversee and abide by terms and conditions stated in the bylaws, or by acts that would constitute a general breach of integrity in the views of the members of the Board of Directors.

ARTICLE V MEETINGS

V.1 General Meetings: The Board of Directors shall meet at least six times per year, at such times and locations as deemed appropriate and suitable. Reasonable notice of all Board meetings shall be provided to each Director by postal mail, electronic mail, telephone or other means of communication, by action of the Chair, Vice Chair, or Secretary of the Board of Directors. The annual meeting will be held in June of each calendar year.

V.2 Special Meetings: The Board of Directors may hold special meetings called by the Chair or in a circumstance when a majority of the Board of Directors shall request a meeting. In the event that a special meeting is called, each Director shall be given 48 hours' notice of the special meeting. Such notice shall specify the business to be transacted at, or the purpose of, the meeting that is called. No other business but that specified in calling the special meeting may be transacted without majority consent of all Directors present at the meeting. Any special meetings of the Board of Directors of the Corporation shall be announced and help in compliance with open meetings law.

V.3 Quorum: A quorum consisting of 50%+1 (fifty percent plus one) or more of all Directors shall be required for all Board of Director meetings

V.4 Attendance by Telephone or Video Messaging: Any one or more Directors may attend Board of Directors meetings via the use of telephone or video messaging, granted that use of such communication devices allows all persons participating in the meeting to hear each other simultaneously.

V.5 Voting: All matters before the Board of Directors shall be approved by a majority vote.

V.6 Specific Matters - Conflicts of Interest: Matters that come before the Board of Directors which places a Director in conflict of interest between the interests of the Corporation, Clemmons STEM Academy and the interest of the Director, his/her family or business, the Director with the conflict shall be prohibited from participating in the discussion and recuse his/herself from voting on the particular matter. The Board of Directors shall comply with the voting and disclosure provisions of Director Conflict of Interest Section of the Non-Profit Corporation Law NCGS 55A-8-31

V.7 Compliance with NC Open Meetings Law: This Corporation shall comply in all respects with the North Carolina Public Schools Law, code section 114C-4 and any other related provision of North Carolina law in connection with all regular or special meetings of the Board of Directors. Except as otherwise permitted by such Open Meeting Laws, and/or North Carolina General Statutes Sections 143-318.9-143-318.19:

A. No quorum of the Board of Directors can hold a meeting in private for the purpose of deciding on or deliberating toward a decision on any matter.

B. No closed executive session shall be held until:

1. The Board shall have first convened in an open session for which notice shall have been given in accordance with law;

2. A majority of the Board at such meeting shall have voted to go into closed executive session;

3. The chairperson or person presiding over the meeting has cited the purpose of the closed executive session and has stated whether or not the Board of Directors shall reconvene after the closed executive session;

4. Closed executive sessions may be held only for purposes permitted by law.

V.8 Meeting Rules & Conduct: Meetings shall be conducted in an open, orderly, and fair manner, and shall be held in compliance with the North Carolina Open Meetings Law. The Board may elect not to proceed in full compliance with modified Roberts Rules of Order, but those procedures may be invoked at any time for use during part or all of a particular meeting upon motion supported by a majority.

ARTICLE VI OFFICERS

VI.1 Officers: The Corporation's officers shall consist of a Chairperson or Chair (Chairman, Chairwoman), Vice Chairperson or Vice Chair (Vice Chairman, Vice Chairwoman), Secretary, and a Treasurer and such other offices as deemed appropriate by the Board of Directors. Designated officers shall have such authority to perform duties as sanctioned by the Board of Directors. These officers shall be elected by majority vote of the Board of Directors, and serve at the pleasure of the Board. Any number of offices may be held by the same Director, other than the offices of Chairperson and Secretary.

VI.2 Procedures of Nomination of Officers: The Board of Directors shall appoint a Nominating committee, charged with the responsibility of presenting a recommendation of candidates for office, to the Board of Directors, at the annual meeting. The Board of Directors may accept or decline the recommendations presented by the Nominating committee. If the recommended candidates are declined, nominations of officers may be entertained by the Board of Directors Chairperson. Nominations must be seconded and the nominee must agree to accept the nomination and fulfill the duties of the office if so elected to the position. Upon the motion, second and majority vote to close nominations, and an election of officers form the list of candidates will be held. Elections for officers are held openly. The candidate receiving the majority of ballots cast in his/her favor will be immediately inaugurated into the office to which they have been elected. In the event of a tie, all ballots will be recast. In the event of another tie, the office shall be awarded to the candidate with the longest cumulative tenure membership on the Board of Directors.

VI.3 Resignation and/or Removal of Officers: Officers may resign from office at any time by written notice of resignation to the Corporation. Such a resignation shall take effect at the time specified or take effect upon its receipt by the Corporation. Officers may be removed from office with or without cause by the Board of Directors by a majority vote of the Board of Directors at any regular or special meeting held by the Board of Directors with a quorum in attendance.

VI.4 Terms of Officers: The terms of the Officers of the Corporation shall be from the time of their election to the next annual meeting or until their successors are chosen by the Board of Directors.

VI.5 Duties of the Offices: The following describes the duties of the offices of the Corporation:

VI.5.1 Duties of the Chairperson: The Chairperson shall preside over all meetings of the Board of Directors of the Corporation and shall be responsible for implementing policies established by the Board of Directors. Chairperson shall establish an agenda, in consultation with the Academy Principal, for each meeting of the Board of Directors. The Chairperson of the Board shall, when requested, counsel with and advise the officers of the Corporation and shall perform such other duties as directed or prescribed by the Board of Directors.

VI. 5.2 Duties of the Vice Chairperson: In the absence of the Chairperson, or in any event that the Chairperson has an inability to serve, or refuses to serve to the duties of office, the Vice Chairperson shall perform the duties of the Chairperson. When so acting, the Vice Chairperson shall have all the powers and authority of the Chairperson, and shall perform other duties as prescribed by the Board of Directors, or Chair.

VI. 5.3 Duties of the Secretary: The secretary shall certify and keep at the principal office of the Corporation the original, or a copy of these bylaws as amended or otherwise altered to date. The Secretary shall see that all notices to the Board of Directors are given in accordance with the provisions of these Bylaws or as required by law. The secretary shall keep a book of the minutes of all meetings of the Directors. The Secretary shall perform such other duties as may be assigned or directed, by the Chairperson or Board of Directors of the Corporation.

VI. 5.4 Duties of the Treasurer: The Treasurer shall be in charge of receiving and distributing to the Board of Directors an accounting of all receipts and disbursements regularly, an annual statement of all receipts and disbursements, and the annual financial audit. These duties may also include the signing of checks or drafts of the Corporation as designated by the Board of Directors.

VI. 5.5 Duties of Other Officers: Other officers of the Corporation shall perform such duties as the Chairperson or Board of Directors may direct or prescribe.

ARTICLE VII PRINCIPAL

VII.1 Selection: The Principal shall be appointed by the Board of Directors, and shall be provided compensation as the Board of Directors may direct. This power may be delegated by the board to an Education Service Provider. If so, the responsibilities related in section VII.2 are also transferred wholly to the Education Service Provider, who may in whole or in part transfer those responsibilities to the Principal.

VII.2 Duties: The Principal has direct interaction with the Board of Directors, as he/she acts at the direction of the Board of Directors over the execution, implementation and directives for Clemmons STEM Academy. The Principal shall supervise and oversee the day-to-day operation of the Corporation in accordance with these bylaws. The Principal oversees the academic and leadership curriculums, as well as the administrative operations of the school. He/she shall be responsible for the direct course of study, conduct and assessment of students and student performance. The Principal is responsible for all required reporting to the State of North Carolina, and with preparing annual operational budgets for submission to the Board of Directors. Subject to the approval of the Board of Directors and in accordance with any hiring policies they have in place, the Principal may employee, evaluate, discipline, and terminate personnel, prescribe duties to employees, and set salary within the minimum and maximum limits established by the Board of Directors. The position of Clemmons STEM Academy Principal serves as director of the school, and is the acting executive on behalf of the Board of Directors. Additionally, the Principal will serve as an ex officio non-voting member of the Board of Directors, with rights to attend and participate in all meetings, discussions and debate except any board meeting called for the purpose of evaluating him or her.

ARTICLE VIII INDEMNIFICATION

VIII.1 Indemnification: The Corporation shall indemnify its Directors, officers, employees, and agents arising out of their status as Directors, officers, employees or agents of the Corporation, or their activities in any of the foregoing capacities in accordance with and to the fullest extent allowable under the provisions of the North Carolina Nonprofit Corporation Act, as same may be amended from time to time, and the Act.

ARTICLE IX CONTRACTS & FISCAL CONTROLS

IX.1 Checks & Drafts: All checks, drafts, or other orders for the payment of money, issued in the name of the Corporation, shall be signed by such officer or officers, agent or agents of the Corporation and in such manner as shall from time to time be determined by resolution of the Board of Directors.

IX.2 Contracts: The Board of Directors may authorize any officer or officers, agent or agents, to enter into any contract or execute and deliver any instrument in the name of and on behalf of the Corporation; and such authority may be general or confined to specific instances.

IX.3 Loans: No loans shall be contracted on behalf of the Corporation and no evidence of indebtedness shall be issued in its name, unless authorized by a resolution of the Board of Directors. Such authority may be general or confined to specific instances, as directed by the Board of Directors.

IX.4 Funds: All funds of the Corporation not otherwise employed shall be deposited to the credit of the Corporation at such banks, trust companies, or other depositories as the Board of Directors may select, or as may be designated by any officer, officers, Directors or other agent, or agents of the Corporation to whom the Board may delegate such power.

IX.5 Acceptance of Gifts: The Board of Directors or any officer or officers or agent or agents of the Corporation to whom such authority may be delegated by the Board, may accept on behalf of the Corporation any contribution, gift, bequest, or devise for the purpose of the Corporation.

IX.6 Bonds: At the direction of the Board, any officer or employee of the Corporation shall be bonded. The Corporation shall pay the expense of procuring any such bonds.

IX.7 Audits: Upon a majority vote of the Board of Directors, the accounts of the Corporation shall be audited by a reputable certified public accountant, whose report shall be submitted to each member of the Board, and kept on file at the offices of the Corporation as required by law.

ARTICLE X DISTRIBUTION OF THE CORPORATION'S ASSETS UPON DISSOLUTION

X.1 Distribution of the Corporation's Assets Upon Dissolution: Upon dissolution, the Board of Directors shall, after paying or making provision for the payment of all of the liabilities of the corporation, assure that assets held by the corporation whose condition required return, transfer, or conveyance be returned, transferred, or conveyed in accordance with such requirements. After such compliance, remaining assets shall be distributed to either the county district school board of education in which the corporation resided, or to a non-profit benefit corporation whose primary purpose is education.

ARTICLE XI NON-DISCRIMINATION

XI.1 Non-Discrimination: This Corporation shall operate entirely on a nondiscriminatory basis with respect to age, sex, race, religion, national origin or disability. This policy shall apply to boards, committees, staff and services.

ARTICLE XII CONFLICT OF INTEREST

XII.1 Conflict of Interest: It is very important that all board members avoid conflicts of interest or perceived conflicts of interest. To this end, a board member should not participate in any discussions or vote on matters that would affect the transactions between the organization and another party that would benefit them or their personal/professional affiliations.

XII.2 Definitions

A. **Interested Person** - Any board member or board committee member who has a direct or indirect financial interest.

B. **Financial Interest** - A person who has directly or indirectly through business, investment or family:

1 an ownership or investment interest in any entity with which the Corporation has a transaction or arrangement, or
2 a compensation arrangement with the Corporation or with any entity or individual with which the Corporation has a transaction or arrangement, or
3 a potential ownership or investment interest in, or compensation arrangement with any entity or individual with which the Corporation is negotiating a transaction or arrangement.

XII.3 Procedures

A. **Duty to Disclose** - In connection with any actual or possible conflicts of interest, an interested person must disclose the existence of his or her financial interest and all material facts to the board and members of committees with board delegated powers considering the proposed transaction or arrangement.

B. **Determining if a Conflict of Interest Exists** - After disclosure of the financial interest and all material facts, and after any discussion with the interested person, he or she shall leave the board or committee meeting while the determination of a conflict of interest is discussed and voted upon. The remaining board or committee members shall decide if a conflict of interest exists.

C. **Procedures for Addressing the Conflict of Interest** - an interested person may make a presentation at the board or committee meeting, but after such presentation, he/she shall leave the meeting during the discussion of, and the vote on, the transaction or arrangement that results in the conflict of interest.

1 The chairperson of the board or committee shall, if appropriate, appoint a disinterested person or committee to investigate alternatives to the proposed transaction or arrangement.
2 After exercising due diligence, the board or committee shall determine whether the Corporation can obtain a more advantageous transaction or arrangement with reasonable efforts from a person or entity that would not give rise to a conflict of interest.
3 If a more advantageous transaction or arrangement is not reasonably attainable under circumstances that would not give rise to a conflict of interest, the board or committee shall determine by a majority vote of the disinterested Directors whether the transaction or arrangement is in the Corporation's best interest and for its own benefit and whether the transaction is fair and reasonable to the Corporation and shall make its decision as to whether or to enter into the transaction or arrangement in conformity with such determination.

D. Violations of the Conflicts of Interest Policy

1 If the board or committee has reasonable cause to believe that a member has failed to disclose actual or possible conflicts of interest, it shall inform the member of the basis for such belief and afford the member an opportunity to explain the alleged failure to disclose.

2 If, after hearing the response of the member and making such further investigation as may be warranted in the circumstances, the board or committee determines that the member has in fact failed to disclose an actual or possible conflict of interest, it shall take appropriate disciplinary and corrective action.

E. Annual Statement of the Board of Directors of Clemmons STEM Academy Inc.

The Clemmons STEM Academy Inc. shall require that all Board of Directors sign an annual statement that he/she:

1 has received a copy of the conflicts of interest policy
2 has read and understands the policy,
3 has agreed to comply with the policy, and
4 understand that the foundation of Clemmons STEM Academy, Inc. is a charitable organization and that in order to maintain its federal tax exemption, it must engage primarily in activities which accomplish one or more of its tax-exempt purposes.

ARTICLE XIII AMENDMENTS

XII.1 Amendments: Except as otherwise provided herein, these bylaws may be amended or repealed and new bylaws may be adopted by the affirmative vote of the Board of Directors at any regular or special meeting of the Board of Directors of the Corporation, and with approval of the State Board of Education.

NORTH CAROLINA
Department of the Secretary of State

To all whom these presents shall come, Greetings:

I, Elaine F. Marshall, Secretary of State of the State of North Carolina, do hereby certify the following and hereto attached to be a true copy of

ARTICLES OF INCORPORATION

OF

CLEMMONS STEM ACADEMY, INC.

the original of which was filed in this office on the 12th day of September, 2017.

Scan to verify online.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Raleigh, this 12th day of September, 2017.

Elaine F. Marshall

Secretary of State

SOSID: 1623572
Date Filed: 9/12/2017 12:29:00 PM
Elaine F. Marshall
North Carolina Secretary of State
C2017 251 02540

State of North Carolina
Department of the Secretary of State

ARTICLES OF INCORPORATION
NONPROFIT CORPORATION

Pursuant to §55A-2-02 of the General Statutes of North Carolina, the undersigned corporation does hereby submit these Articles of Incorporation for the purpose of forming a nonprofit corporation.

1. The name of the nonprofit corporation is: Clemmons STEM Academy, Inc.

2. __x (Check only if applicable.) The corporation is a charitable or religious corporation as defined in NCGS §55A-1-40(4).

3. The name of the initial registered agent is: W. E. Goodall, Jr.

4. The street address and county of the initial registered agent's office of the corporation is:

   Number and Street: 2132 Greenbrook Pkwy

   City: Weddington State: NC Zip Code: 28104 County: Union _____

   The mailing address ***if different from the street address*** of the initial registered agent's office is:

   Number and Street or PO Box: _____

   City: _____ State: ___NC__ Zip Code: _____ County: _____

5. The name and address of each incorporator is as follows:

Name	Address
W. E. Goodall, Jr.	2132 Greenbrook Pkwy., Weddington, NC 28104
_____	_____
_____	_____
_____	_____

6. (Check either "a" or "b" below.)

   a.___The corporation will have members.

   b._x_The corporation will not have members.

7. Attached are provisions regarding the distribution of the corporation's assets upon its dissolution. See attached

8. Any other provisions which the corporation elects to include are attached.

9. The street address and county of the principal office of the corporation is:

Principal Office Telephone Number: 704-236-1234

Number and Street: 2132 Greenbrook Pkwy

City: Weddington_ State: NC __Zip Code: _28104_ County: Union

The mailing address ***if different from the street address*** of the principal office is:

Number and Street or PO Box: _____

City: _____ State: _____ Zip Code: _____ County: _____

10. **(Optional):** Listing of Officers (See instructions for why this is important)

Name	Address	Title

11. **(Optional):** Please provide a business e-mail addres ***Privacy Redaction*** t no charge when a document is filed. The e-mail provided will not be viewable on the website. For more information on why this service is being offered, please see the instructions for this document.

12. These articles will be effective upon filing, unless a future time and/or date is specified: _____

This is the 5th day of Sept. ,2017____.

Incorporator Business Entity Name

W. E. Goodall, Jr.

Signature of Incorporator

W. E. Goodall, Jr. Incorporator

Type or print Incorporator's name and title, if any

CLEMMONS STEM ACADEMY, INC.

Purpose of Corporation

This corporation is organized for the following purpose(s) (*check as applicable*):

____religious,

____charitable,

_x__educational,

____testing for public safety,

____scientific,

____literary,

____fostering national or international amateur sports competition, and/or

____prevention of cruelty to children or animals,

including, for such purposes, the making of distributions to organizations that qualify as exempt organizations under Sections 501(c)(3) and 170(c)(2) of the Internal Revenue Code of 1986 (herein the "Code") (or the corresponding provisions of any future United States Internal Revenue Code).

Prohibited Activities

No part of the net earnings of the corporation shall inure to the benefit of or be distributable to, its members, directors, officers, or other private persons except that the corporation shall be authorized and empowered to pay reasonable compensation for services rendered and to make payments and distributions in furtherance of purposes set forth in these articles of incorporation. No substantial part of the activities of the corporation shall be the carrying on of propaganda or otherwise attempting to influence legislation, and the corporation shall not participate in or intervene in (including the publishing or distribution of statements) any political campaign on behalf of or in opposition to any candidate for public office. Notwithstanding any other provisions of these articles, the corporation shall not carry on any other activities not permitted to be carried on (a) by a corporation exempt from federal income tax under Section 501(c)(3)of the Code or (b) by a corporation, contributions to which are deductible under Section 170(c)(2) of the Code.

Distributions Upon Dissolution

Upon the dissolution of the corporation, the Board of Directors shall, after paying or making provision for the payment of all of the liabilities of the corporation, dispose of all of the assets of the corporation exclusively for the purposes of the corporation in such manner, or to such organization or organizations organized and operated exclusively for religious, charitable, educational, scientific or literary purposes as shall at the time qualify as an exempt organization or organizations under Section 501(c)(3) of the Code as the Board of Directors shall determine, or to federal, state, or local governments to be used exclusively for public purposes. Any such assets not so disposed of shall be disposed of by the Superior Court of the county in which the principal office of the corporation is then located, exclusively for such purposes or to such organizations, such as the court shall determine, which are organized and operated exclusively for such purposes, or to such governments for such purposes.

BB&T Insurance Services
Global Resources — Client Focused

Clemmons Charter School

Quote Proposal Date: 9/20/17

Coverage	Limits	Estimated Premium
General Liability	$3M	$2,800
Educators Legal Liability	$2M	$2,100
Directors & Officers	$2M	
Employment Practices	$2M	
Sexual Misconduct	$2M	$1,100
Crime Policy/Employee Theft	$250K	$450
Employee Benefit Liability	$3M	$450
Flood Insurance & Earthquake	$1M	$950
Property Insurance	$4M	$4,000
Student Accident	25K/1M	$1,100
Hired/Non Owned Auto	$1M	$350
Data Compromise	$100K	$100
Adverse Event Coverage (active shoot)	$300K	$150
Workers Compensation	$1M/1M/1M	$6,800
Total Estimated Premium:		**$20,350**

NC Charter School

	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Enrollment	554	665	798	798	798
State Revenue (incl EC)	3,080,673	3,715,471	4,458,566	4,458,566	4,458,566
County Revenue	1,232,650	1,535,500	1,845,375	1,845,375	1,845,375
Federal Revenue (EC)	82,885	100,216	120,259	120,259	120,259
After School/Enrichment	70,000	70,000	70,000	70,000	70,000
Fundraising & Other	25,000	32,500	32,500	32,500	32,500
total other	177,885	202,716	222,759	222,759	222,759
	4,491,208	5,453,687	6,526,699	6,526,699	6,526,699
Expense					
1. and 2. Salaries + Benefits	2,501,606	2,939,393	3,451,625	3,451,625	3,451,625
3. Books & Supplies	251,250	258,350	241,200	192,600	194,600
4. Technology	37,000	40,000	42,000	44,000	44,000
5. Non Cap Equip & Leases	200,000	235,000	265,000	265,000	265,000
6. Contracted Student Services	70,000	75,000	80,000	85,000	86,000
7. Staff Development	76,000	80,000	82,000	82,000	82,000
8. Administrative Services	173,226	202,969	235,558	238,633	239,815
9. Insurances	20,350	28,950	34,250	34,250	34,250
10. Rents and Debt Service	565,000	765,000	1,015,000	1,115,000	1,215,000
11. Facilities	85,050	85,400	85,500	86,500	88,500
12. Utilities	76,500	86,500	89,500	89,500	89,500
13. Transportation and Travel	53,500	53,500	53,500	69,500	63,500
14. Capital Purchases	20,000	20,000	20,000	41,000	41,000
15. Before and After Care	40,338	42,165	42,165	42,165	42,165
total operating expenses	1,671,264	1,972,834	2,285,673	2,385,148	2,485,330
Total Expenses	4,169,820	4,912,227	5,737,297	5,836,772	5,936,955
Net surplus (deficit)	321,388	541,460	789,402	689,927	589,744
Cumulative Net Surplus/Deficit	321,388	862,848	1,652,250	2,342,177	2,931,921

NC Charter School Worksheet						
Revenue Worksheet	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	
Rev- Federal EC Funds	$82,885	$100,216	$120,259	$120,259	$120,259	
Rev - Charter Schools ADM - State	$ 2,848,992	$ 3,432,610	$ 4,119,132	$ 4,119,132	$ 4,119,132	
Rev - EC Funds - State	$ 231,681	$ 282,861	$ 339,433	$ 339,433	$ 339,433	
	$ 3,080,673	$ 3,715,471	$ 4,458,566	$ 4,458,566	$ 4,458,566	
TOTAL STATE REVENUE	$ 3,163,558	$ 3,815,687	$ 4,578,824	$ 4,578,824	$ 4,578,824	
Rev - WS Forsyth	$560,925	$672,300	$807,975	$807,975	$807,975	
Rev -Guilford	$671,725	$863,200	$1,037,400	$1,037,400	$1,037,400	
TOTAL LOCAL REVENUE	$1,232,650	$1,535,500	$1,845,375	$1,845,375	$1,845,375	
# Student Assumptions	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	
Total (for State Funding)	554	665	798	798	798	
EC	55	67	80	80	80	
By County for County Funding						
WS/Forsyth	554	664	798	798	798	
Guilford						
	554	664	798	798	798	
Per Student Funding						
State WS/F	5161.82	5161.82	5161.82	5161.82	5161.82	
State Guilford	5123.35	5123.35	5123.35	5123.35	5123.35	
EC WS/F	4253.55	4253.55	4253.55	4253.55	4253.55	
EC Guilford	4171.22	4171.22	4171.22	4171.22	4171.22	
County Funding						
WS/Forsyth	$ 2,025	$ 2,025	$ 2,025	$ 2,025	$ 2,025	
Guilford	$ 2,425	$ 2,600	$ 2,600	$ 2,600	$ 2,600	
# Students by Grade						
Kindergarten	80	80	80	80	80	
1st	84	84	84	84	84	
2nd	84	84	84	84	84	
3rd	84	84	84	84	84	
4th	88	88	90	90	90	
5th	88	88	90	90	90	
6th	46	88	96	96	96	
7th	0	69	96	96	96	
8th	0	0	94	94	94	
	554	665	798	798	798	
# Elementary	508	508	512	512	512	
# Middle	46	157	286	286	286	
EC and Other State Funds per ADM						
County	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	

buildinghope

QUALITY/RESULTS/GROWTH FOR PUBLIC CHARTER SCHOOLS

August 11, 2017

RE: Clemmons STEM Academy, Inc.

To whom it may concern:

Building Hope is a non-profit foundation based in Washington, DC that works to close the educational achievement gap by giving students access to high quality public charter schools in cities across the country. We support the expansion of academically successful schools with the capacity to grow their enrollments in order to catalyze change across their local public education systems by providing technical and financial assistance related to capital projects. Our services may also include grants to pay for professional fees associated with a project (i.e., architect, engineering), or other project-specific needs and sponsoring school fundraising events to support the academic program.

Building Hope is committed to support **Clemmons STEM Academy, Inc.** in securing a long-range plan for the opening of the above-referenced charter school. In order to ensure that the charter school is able to secure working capital for opening, Building Hope can offer a number of different services including facility and working capital financing. Building Hope may provide such financial assistance to the charter school by:

- Lending funds to for facilities acquisitions and/or improvements at below-market rates.
- Guaranteeing, insuring, and reinsuring debt used to assist charter schools to acquire, renovate, or construct school facilities.
- Guaranteeing or insuring leases of personal or real property that are needed to begin or continue the operation of the charter schools.
- Facilitating financing by potential lenders.
- Facilitating the issuance of bonds by charter schools or other public entities for the benefit of charter schools.
- Credit Enhancement Program

In addition, if the charter school is unable to secure a start-up grant, Building Hope can secure a line of credit for the school to help with the startup costs. Building Hope provides loan guarantees to make facilities financing more affordable for public charter schools throughout the United States. Guarantees range in size from $250,000 to $1 million. They have a five-year term with a 1% commitment fee and a 1% annual guaranty fee.

Sincerely,

Richard Moreno
Vice-President
Southern Region

Legos Educational Program - Legos Education provides a myriad of STEM activities for students in grades K-8 that blend grade level content standards with a technology infused delivery and hands-on projects to teach mathematical, science and engineering topics, concept through execution. The Legos program is a balanced curriculum that also incorporates literacy (Reading and Writing). The adopted program for Elementary students includes: WEDO STEM projects, Story Starter, Build to Express, More to Math and Simple Machines**.** Examples of these curriculum resources and projects are included in the appendices.

Engineering Is Elementary (EiE) - *Engineering and Technology Lessons for Children* developed by the National Center for Technological Literacy (NCTL) will be used by teachers to augment lessons, create interdisciplinary projects, and reinforce science concepts being taught in grades 1-5. The EiE curriculum is NOT an independent curriculum. Rather, since it is integrated with science the lessons assume that the students are studying or have already studied the science concepts that are then utilized in the engineering lessons. Each EiE unit is paired with a science topic or topics from the general standards-based curriculum.

Tig Tag (http://www.tigtagcarolina.com/) - Tig Tag is an online video resource that helps teach science to elementary students in grades K-5. Tig Tag's 600 videos offer spectacular footage from NASA, CBS, the BBC, and other sources, and all are original and purpose-made. It also includes ready-made lesson plans as well as a library of images, diagrams, worksheets, and quizzes that help ensure a memorable experience. It also includes ready-made lesson plans as well as a library of images, diagrams, worksheets, and quizzes that help ensure an engaging and memorable experience is created for the learner.

Twig (https://www.twigcarolina.com/) - Twig has a comprehensive set of 3-minute videos, each combining rigorous research with stunning visuals to support inspirational science andmath teaching in the classroom for students in grades 5-8. The more than 1,000 videos offer spectacular footage from NASA, CBS, the BBC, and other sources, and all are original and purpose-made. Twig provides teachers with several avenues to differentiate learning. ELLs benefit from having images and vocabulary that connect, and dyslexic students have the benefit of hearing and seeing notes simultaneously. Students who have attention disorders can easily be refocused with the short videos. Quizzes come in two levels, to differentiate between your at-grade-level students and above-grade-level students. Twig is one additional avenue for the School to challenge students and to provide them with technology infused educational resources purposefully identified to meet the STEM initiative in a variety of meaningful ways.

PLTW - The School will adopt Project Lead The Way (PLTW) in the middle school grades with potential to expand programs into elementary school over time as necessary. The School administration and selected teachers will work as a team to select electives from PLTW that best fit the needs of the School community. Available tracks of study include engineering, biomedical science, and computer science. In addition to hands-on, project-based curriculum, PLTW programs include high-quality professional development training that provides teachers with the support and resources they need to devote more time to inspiring students. Designated teachers will spend several days at training preparing for the new courses and learning from other PLTW

teachers across the country. Project Lead The Way (PLTW) is a nonprofit organization that provides a transformative learning experience for K-12 students and teachers across the U.S. (ww.pltw.org)

Grade 6 Exploration of Production and Technology - As part of the requirements of this elective students will be participating in the *FIRST* LEGO League Competition. The best way to summarize *FIRST* LEGO League is to say that it is a robotics program for 9 to 14 year olds which are designed to get children excited about science and technology -- and teach them valuable employment and life skills. NCL is used in a classroom setting but is not solely designed for this purpose. Teams, composed of up to ten children with at least one adult coach, can also be associated with a pre-existing club or organization. The coaches DO NOT need any technical experience. In NCL, the children do the work, and the work is programming an autonomous robot (using the LEGO® MINDSTORMS® robot set) to score points on a thematic playing surface, creating an innovative solution to a problem as part of their project, all while being guided by the NCL Core Values. These three elements - the Robot Game, Project, and NCL Core Values - make up what is called the yearly Challenge. Like any other organized "sport", teams also fundraise, create a team identity, and go on field trips.

Grade 7 Research VEX Robotics - The VEX Robotics Design System offers students an exciting platform for learning about areas rich with career opportunities spanning science, technology, engineering and math (STEM). These are just a few of the many fields students can explore by creating with VEX Robotics technology. Beyond science and engineering principles, a VEX Robotics project encourages teamwork, leadership and problem solving among groups. It also allows teachers to easily customize projects to meet the level of students' abilities.

Students also participate in the VEX Robotics competition. The VEX Robotics Design System was developed and engineered with co-curricular and extracurricular robotics competitions specifically in mind. This program is specifically tailored to bring the magic of robotics competition into the classroom. Robotics can be used as an engaging way to integrate all facets of STEM education into the classroom and head-to-head competition as a natural way to capture students' attention.

Grade 8 Research SimCity (Future City Engineering)- This NCexible, cross-curricular educational program gives students an opportunity to do the things that engineers do—identify problems; brainstorm ideas; design solutions; test, retest and build; and share their results. This process is called the engineering design process. With this at its center, Future City is an engaging way to build students' 21st century skills.

As part of this elective students will participate in the Future City competition. The Future City Competition is a national, project-based learning experience where students in 6th, 7th, and 8th grade imagine, design, and build cities of the future. Students work as a team with an educator and engineer mentor to plan cities using SimCity™ 4 Deluxe software; research and write solutions to an engineering problem; build tabletop scale models with recycled

Teaching Students 21st Century Leadership and Life Skills

When Principal Muriel Summers asked parents and business leaders what they wanted in their schools, what she heard reinforced what most people believe—that our schools should not merely be focused on improving test scores, but should provide opportunities for students to develop their full potential.

- Leadership
- Responsibility
- Accountability
- Problem Solving
- Adaptability
- Communication
- Initiative and Self-Direction
- Creativity
- Cross-Cultural Skills
- Teamwork

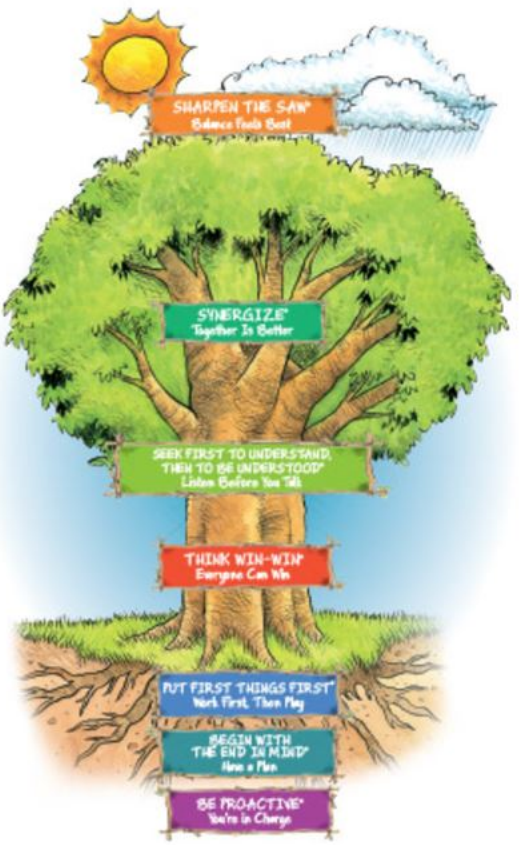
Using Best-Practices and Universal Principles

The Leader in Me is aligned with best-in-class content and concepts practiced by global education thought leaders. It provides a logical, sequential and balanced process to help schools proactively design the culture that reflects their vision of the ideal school.

Content from *The 7 Habits of Highly Effective People* is a key component of the overall *The Leader in Me* process. *The 7 Habits* is a synthesis of universal, timeless principles of personal and interpersonal effectiveness, such as responsibility, vision, integrity, teamwork, collaboration and renewal, which are secular in nature and common to all people and cultures.

Click here for a synopsis of the habits in kids' language.

The Leader in Me is also aligned to many national and state academic standards. The process teaches students the skills needed for academic success in any setting. These skills include critical thinking, goal setting, listening and speaking, self-directed learning, presentation-making and the ability to work in groups.



And a New Mindset

Instead of seeing children through the lens of a normal distribution curve—some kids are naturally smart and others are not—*The Leader in Me* paradigm sees that every child is capable, every child is a leader. This paradigm changes everything.

PLTW Gateway Unit Descriptions

Design and Modeling
Students apply the design process to solve problems and understand the influence of creativity and innovation in their lives. Using Autodesk® design software, students create a virtual image of their designs and produce a portfolio to showcase their innovative solutions.

Automation and Robotics
Students trace the history, development, and influence of automation and robotics as they learn about mechanical systems, energy transfer, machine automation, and computer control systems. Students use the VEX Robotics® platform to design, build, and program real-world objects such as traffic lights, toll booths, and robotic arms.

App Creators
This unit exposes students to computer science as a means of computationally analyzing and developing solutions to authentic problems through mobile app development, and conveys the positive impact of the application of computer science to other disciplines and to society.

Computer Science for Innovators and Makers
Throughout the unit, students learn about programming for the physical world by blending hardware design and software development, allowing students to discover computer science concepts and skills by creating personally relevant, tangible, and shareable projects.

Energy and the Environment
Students are challenged to think big and toward the future as they explore sustainable solutions to our energy needs and investigate the impact of energy on our lives and the world. They design and model alternative energy sources and evaluate options for reducing energy consumption.

Flight and Space
The exciting world of aerospace comes alive through Flight and Space. Students explore the science behind aeronautics and use their knowledge to design, build, and test an airfoil. Custom-built simulation software allows students to experience space travel.

Science of Technology
Science impacts the technology of yesterday, today, and the future. Students apply the concepts of physics, chemistry, and nanotechnology to STEM activities and projects, including making ice cream, cleaning up an oil spill, and discovering the properties of nano-materials.

Magic of Electrons
Through hands-on projects, students explore electricity, the behavior and parts of atoms, and sensing devices. They learn knowledge and skills in basic circuitry design, and examine the impact of electricity on the world around them.

Green Architecture
Today's students have grown up in an age of "green" choices. In this unit, students learn how to apply this concept to the fields of architecture and construction by exploring dimensioning, measuring, and architectural sustainability as they design affordable housing units using Autodesk's® 3D architectural design software.

Medical Detectives
Students play the role of real-life medical detectives as they analyze genetic testing results to diagnose disease and study DNA evidence found at a "crime scene." They solve medical mysteries through hands-on projects and labs, investigate how to measure and interpret vital signs, and learn how the systems of the human body work together to maintain health.

ClemmonsSTEM Academy Discipline Plan
(Updated 6-22-17)

Discipline Philosophy

We view discipline as a means of promoting positive character by establishing trust, respect and productive relationships that help maintain a community of strong communicators, courageous problem solvers and responsible citizens. In our discipline program, we strive for the full cooperation of all students, parents, teachers and school leadership, where everyone involved supports and embraces the actions necessary to maintain a culture that embodies the CSA Mission Statement & Core Values.

School Leadership Commitment: School leadership will model, promote, and inspire others to support and embrace this philosophy by demonstrating respect for students, parents, teachers and community members through the way they lead, relate, and communicate, while supporting teachers as they work to fulfill their commitment of establishing a culture of respect.	**Teacher Commitment:** Teachers will model, promote, and inspire others to support and embrace this philosophy by establishing a respectful environment where each child has a positive relationship with a caring adult, where a student is treated as an individual, and where teachers work collaboratively with all parties involved highlighting the positive in each student, and holding them accountable in a fair, productive manner when expectations are not being met.
Student Commitment: Students will model, promote, and inspire others to support and embrace this philosophy by following school wide and classroom expectations at all times in action and in attitude, addressing and/or reporting behaviors that are unsafe or disrespectful to themselves or others, accepting responsibility for their actions, taking steps to resolve the issue, and when necessary, accepting consequences for failing to meet expectations.	**Parent Commitment:** Parents will model, promote, and inspire others to support and embrace this philosophy by reinforcing school wide and classroom expectations at home and by supporting staff members through communication & collaboration, helping identify, address and overcome any obstacles in the process.

CSA Core Values

Positive Character	Academic Excellence	Service and Leadership

Core Expectations for Students

I am respectful.	I am responsible.
I am safe.	I am resourceful.

Response at the Teacher Level

Options for Celebrating Positive Behaviors

Praise (Both classroom and school wide)	
Visual acknowledgements (Standing ovations & bulletin boards)	Leadership Celebration
Note, phone call, e-mail or post card home	
Privileges (Lunch buddy-students or other adults, extra computer time, eating outside, Discovery Ed video during lunch, outside activity, special job, choosing a class book or activity, sitting in teacher chair or teacher desk, -for exploratory team-exploratory free choice day, student suggested privileges…)	

Steps for Addressing Other Behaviors

The following levels are used <u>within the course of a single school day</u> when students are not complying with the rules:

Step 1-- Teachers use the following intervention/consequence to help the student to appropriately modify their behavior:	Verbal Warning
Step 2—Teacher to use one of the following when the level 1 intervention/ consequence has been ineffective or a new inappropriate behavior has been exhibited:	In class time out, note of apology, journal or email reflection, loss of privilege for a portion of the school day, or other appropriate logical consequence
Step 3-- Teacher to use one of the following when the	Time out in buddy classroom, loss of privilege that

level 2 intervention/consequence has been ineffective or a new inappropriate behavior has been exhibited.	extends for the duration of the school day (K-2) or up to two school days (3-5). *Parent Contact is required*
Step 4-- used when previous levels of intervention/consequence have been ineffective in modifying student behavior OR for infractions not addressed by classroom rules (See next page).	Office referral

Response Plan for Infractions at the School Leadership Level

Category One Infractions	**Recommended Response** *Consequences for tardiness reset each quarter.*

Category Two Infractions	**Recommended Response**
2a. Continual Teacher-Level Infractions, including, but not limited to, not bringing classroom materials, not participating in classroom activities, not completing work in a reasonable time frame, talking without permission, sleeping or having head down, drinking or eating (including candy and gum) without permission, not following all classroom procedures, etc. For lower school, this includes not following dress code. **2b. Irresponsible Behavior** leading to things such as loss of property, unintentional damage of property, incidental physical contact or unintentional offense, concern or embarrassment of a student, if to a degree necessary to involve school leadership. **2c. Dress Code Violation** (Applies only to middle and high school students). **2d. Failure to Serve Detention** (Applies only to middle and high school students). **2e. Campus Procedures Violation**, including, but not limited to, being in an unauthorized area, being somewhere without permission, taking unauthorized routes, acting in a manner that is risky or unsafe for oneself and others, transitioning with technology, playing music or videos without head phones or earbuds, etc. This does not include related infractions in higher categories. **2f. Misuse of Technology**, including, but not limited to, taking and/or taking and uploading unauthorized pictures or videos during school activities, not including any disrespectful, sexual or aggressive content or messages. **2h. Inappropriate Display of Affection**, not including related infractions in higher categories (Brief hugs and hand holding are permitted in middle and high school.). **2i. Possession or use of Non-Prescription Medicine without Permission**, not including related infractions in higher categories.	**Level I (One-Three Infractions)** Parent Contact Parent Conference with Admin. Parent Conference with Principal **Level II (Four Infractions)** One Day OSS **Level III (Five or more Infractions)** Two Days OSS

Category Three Infractions	**Recommended Response**
3a. Continual Teacher-Level Infractions, including, but not limited to, causing distractions/disruptions or being disrespectful to staff or students in minor ways. **3b. Disrespect towards a Student,** including, but not limited to, unwelcome flirting or propositions, name calling, mocking, ridiculing, insulting, taunting, slandering, retaliating or excluding in any form or for any reason, tampering with or damaging personal property, if to a degree that seems necessary to involve school leadership. **3c. Irresponsible Behavior** leading to the unintentional, minor injury of someone, *if* to a degree that seems necessary to involve school leadership**.** **3d. Leaving Class without Permission**, not including related infractions in	**Level I (One-Two Infractions)** Parent Contact Parent Conference **Level II (Three-Four Infractions)** One Day OSS Two Days OSS **Level III (Five or more Infractions)** Three Days OSS

higher categories, such as insubordination or disrespect to an adult. **3e. Throwing an Object** at someone in a way that is disrespectful but not aggressive, if to a degree that seems necessary to involve school leadership. **3f. Possession or use of One's Own Prescription Medicine without Permission**, not including related infractions in higher categories **3g. Using or displaying profanity, vulgarity or discriminatory language or gestures,** not connected to or directed towards a specific person or used in a way that may seem to be connected to or directed towards a certain person. This applies to audio and video content but does not include related infractions in higher categories. **3h. Possession of Vulgar or Pornographic Images** in any medium, also including such images that may have been drawn or created. This does not include related infractions in higher categories. **3i. Supporting or glorifying offensive, disturbing, unethical or criminal activity** through comments, conversations, images, signals, drawings, media, attire, etc. This does not include related infractions in higher categories.	
Category Four Infractions	**Recommended Response**
4a. Disrespect towards an Adult, including, but not limited to, being slow to comply, arguing/disputing, raising the voice, expressing anger or frustration towards an adult, using sarcasm, mocking, slandering, etc. **4b. Disrespect towards a Student,** including, but not limited to, unwelcome flirting or propositions, name calling, mocking, ridiculing, insulting, taunting, slandering, retaliating or excluding in any form or for any reason, tampering with or damaging personal property. Must also include things like profanity, vulgarity, vulgar images or gestures, or discriminatory language used in a way that is connected to or directed towards a person or shown to a person in a way that is unwelcome or disrespectful. This does not include related infractions in higher categories. **4c. Disrespect towards a Student,** including posturing, challenging or provoking. This may include some level of physical contact. **4d. Lying to an Adult or Failing to Provide Necessary Information,** including intentionally withholding information, giving misleading information, impeding an investigation, etc. **4e. Cutting Class**, not including skipping school or leaving campus without permission. **4f. Cheating & Plagiarism** (See student handbook for definition.) **4g. Disruptive Behavior** that significantly interrupts regular school activity. **4h. Congregating** around a fight or disruptive activity, organizing a disruptive or disorderly gathering, identifying or acting with a group to cause disruption, etc. This does not include related infractions in higher categories. **4i. Instigating** and/or encouraging others to use aggressive actions. **4j. Interfering with a Safety Drill in any way,** including but not limited to acting irresponsibly, failing to follow directions, or causing a disruption. **4k. Tampering with School Property**, not causing damage **4m. Falsifying Documents** **4n. Gambling** for money or personal property.	**Level I (One Infraction)** Parent Conference **Level II (Two-Four Infractions)** One Day OSS Two Days OSS Three Days OSS **Level III (Five or more Infractions)** Four Days OSS
Category Five Infractions	**Recommended Response**
5a. Disrespect towards an Adult, including, but not limited to, blatant defiance and/or walking away without permission when being addressed	**Level I (One Infraction)** Parent Conference

by an adult. This may also include using profanity, vulgarity or discriminatory speech during any interaction with an adult. This does not include related infractions in higher categories. **5b. Verbal Aggression towards a Student**, including any type of intimidating or threatening speech not serious enough to be included in Category Nine. **5c. Physical Aggression towards a Student**, including a physical act of anger, retaliation or intimidation such as grabbing or shoving that is not serious enough to be considered a higher-category infraction. **5d. Leaving Campus without Permission or Skipping School** **5e. Refusal to Allow Search** of personal belongings, desk, locker, car, or related areas where a student may possess something of concern to administration and where reasonable cause has been established. **5f. Possession of a Potentially Dangerous Device** not considered a weapon. **5g. Lighting a Fire** in any manner but not such that it is considered arson. **5j. Theft** of item(s) valued at $50 or less. **5k. Vandalism** causing damages that total $50 or less.	**Level II (Two-Four Infractions)** Two Days OSS Three Days OSS Four Days OSS **Level III (Five or more Infractions)** At least Five Days OSS and/or Disciplinary Reassignment

Prevent
Teach, model, and practice expectations

Reinforce
Recognize and reward followed expectations

Eliminate
Identify and eliminate the cause of problem behaviors

Managing Undesirable Behaviors

Is behavior teacher or administration managed?

Warning
Reteach the expectation and remind student of possible consequences

Intervention
Implement logical intervention or consequence
Begin documentation on "Behavior Tracking Form"

New environment
Select and implement a new intervention or alternate setting for the student

After 3 attempted Tier 1 interventions are recorded on "Behavior Tracking Form", student is referred to guidance or admin. Parent is contacted

Once 2 referrals are reached, Tier 2 interventions will be activated

Teacher Managed Behaviors

- Disrespect including tone, attitude or body language
- Minor Disrespect towards Property
- Refusal to work
- Unscholarly habits *
- Minor disruption
- Not following routines
- Misuse of Supplies
- Minor dishonesty/ stealing
- Inappropriate language
- Teasing
- Minor aggression such as unsafe or rough play

Administration Managed Behaviors

- Aggressive physical contact
- Fighting
- Bullying **
- Major Property Damage
- Major dishonesty or theft
- Cheating, forgery, plagiarism, or copying
- Illegal Substance
- Weapon
- Inappropriate Use of Technology
- Cutting class, skipping school or leaving campus

Address
Staff member completes Administration Referral Form

Discern
Administrator identifies cause of problem behavior

Make decision
Administrator selects appropriate consequence or intervention

iMplement
Staff and administration execute determined consequence or intervention

Need to Know
Administration reports outcome to parents and involved staff

*Unscholarly habits include, but is not limited to, not bringing classroom materials, not participating in classroom activities, not completing work in a reasonable time frame, talking without

permission, sleeping or having head down, drinking or eating (including candy and gum) without permission, not following all classroom procedures,
** Bullying includes, but is not limited to, a pattern of aggressive or abusive language, harassment of students or staff, racial/ethnic/sexual discrimination

Appendix P:

Charter School Required Signature Certification

Note: *Outlined below is a list of areas that must be certified by the proposed Board of Directors. Any forms Not Applicable to the proposed charter school indicate below with N/A and provide a brief explanation for providing such response.*

Serving on a public charter school board is a position of public trust and board members of a North Carolina public charter school; you are responsible for ensuring the quality of the school's entire program, competent stewardship of public funds, the school's fulfillment of its public obligations, all terms of its charter, and understanding/overseeing all third party contracts with individuals or companies.

- The selected Board Attorney that he/she has reviewed with the full Board of Directors, listed within the application, all the governance documents and liabilities associated with being on the Board of a Non Profit Corporation.
  - Name of the Selected Board Attorney: **Kimberly Herrick, Attorney at Law**
  - Date of Review: **September 15, 2017**
  - Signature of Board Members Present (Add Signature Lines as Needed):

DocuSigned by: B639BDC7434C4AA... DocuSigned by: 28234B7676914EC...

DocuSigned by: FEFF9CCFF1FC473...

DocuSigned by: 205B3E8D2AB447E... DocuSigned by: DD45D691A59A4BA...

- The selected Board Auditor that he/she has reviewed with the full Board of Directors, listed within the application, all the items required for the annual audit and 990 preparations.
  - Name of the Selected Board Auditor: **Courtney LaLone, LBA Haynes Strand PLLC**
  - Date of Review: **September 15, 2017**
  - Signature of Board Members Present (Add Signature Lines as Needed):

DocuSigned by: B639BDC7434C4AA... DocuSigned by: 28234B7676914EC...

DocuSigned by: FEFF9CCFF1FC473...

DocuSigned by: 205B3E8D2AB447E... DocuSigned by: DD45D691A59A4BA...

- If contracting with a CMO/EMO, that the selected management company has reviewed with the full Board of Directors, listed within the application, all the items required and the associated management contract and operations.
  - Name of the Contact for Selected EMO/CMO: **N/A (not contracting with a CMO/EMO)**
  - Date of Review: **N/A**
  - Signature of Board Members Present (Add Signature Lines as Needed):
    - _____
    - _____
    - _____
    - _____
    - _____
    - _____
    - _____
- If contracting with a financial management service provider that the selected financial service provider has reviewed with the full Board of Directors, listed within the application, all the financial processes and services provided.
  - Name of the Contact: **Marianne Levigne**
  - Name of the Selected Financial Service Provider: **LBA Haynes Strand PLLC**
  - Date of Review: **September 15, 2017**
  - Signature of Board Members Present (Add Signature Lines as Needed):
    - DocuSigned by: B639BDC7434C4AA... DocuSigned by: 28234B7676914EC...
    - _____
    - DocuSigned by: 205B3E8D2AB447E... DocuSigned by: DD45D691A59A4BA...

DocuSigned by: FEFF9CCFF1FC473...
- If the proposed Board of Directors, listed within the application, is contracting with a service provider to operate PowerSchool that the service provider has reviewed all of the financial processes and services provided.
  - Name of the Contact: **Marianne Levigne**
  - Name of the Selected PowerSchool Service Provider: **LBA Haynes Strand PLLC**
  - Date of Review: **September 15, 2017**
  - Signature of Board Members Present (Add Signature Lines as Needed):
    - DocuSigned by: B639BDC7434C4AA... DocuSigned by: 28234B7676914EC...
    - _____
    - DocuSigned by: 205B3E8D2AB447E... DocuSigned by: DD45D691A59A4BA...

DocuSigned by: FEFF9CCFF1FC473...

Certification

I, DocuSigned by: 28234B7676914EC... _____, as Board Chair, certify that each Board Member has reviewed and participated in the selection of the individuals and vendors attached to this document as evidenced by the full Board of Director signatures outlined above. The information I am providing to the North Carolina State Board of Education as Clemmons STEM Academy Charter School is true and correct in every respect.

DocuSigned by: 28234B7676914EC... 9/18/2017

Signature Date