



An At-Home Guide for Families

7th Grade Science in North Carolina Public Schools

Course Outline

At the end of the course, my child will know...


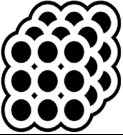







- how to describe the characteristics of layers of the atmosphere.
- the main environmental issues and how personal decisions impact the environment.
- how to explain global winds, the jet stream, and weather and climatic conditions.
- about pressure systems and fronts and the weather systems that result from these.
- how we predict weather systems and patterns based on information.
- about different types of storms, how they form, and how we measure their activity.
- the ways energy is transformed from one form to another.
- how simple machines such as inclined planes, pulleys, levers, and wheel and axles are used to create mechanical advantage and increase efficiency.
- explain how electrical energy is produced.
- how to define force and motion.
- about the various types of forces: friction, gravity, and magnets.
- how to explain free fall and air resistance concepts with consideration of gravity, friction, and velocity.
- about Sir Isaac Newton and his laws of motion.
- the structures and functions of plant and animal cells, including major organelles
 - cell membrane
 - cell wall
 - nucleus
 - chloroplasts
 - mitochondria
 - vacuoles
- about basic genetic and heredity patterns.
- how to explain mitosis and meiosis.
- about genetic disorders.
- how the environment impacts genetics.
- the major functions of the human body systems

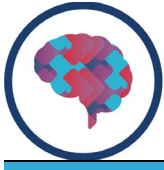
Curious what the specific standards are for 7th Grade Science in North Carolina?

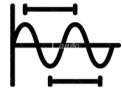





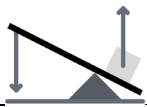






Check out the [North Carolina Standard Course of Study](#) to learn more. Looking for additional explanations about what students should be able to do at the end of this course? Check out [NC DPI's unpacked contents document](#) aligned to the course standards.







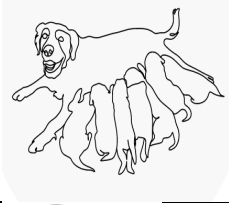


Key Vocabulary

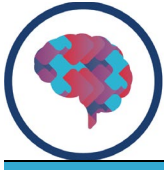
Visual	Term	Definition
	Atmosphere	Layers of gases surrounding a planet.
	Density	The number of air particles in a particular location
	Barometer	Tool used to measure atmospheric pressure.
	Ozone Layer	Layer in the atmosphere containing the gas ozone, which absorbs most of the sun's ultraviolet radiation
	Pollution	The introduction of harmful materials into the environment.
	Clean Air Act	A federal law that focuses on improving air quality across the U.S.
	Greenhouse Effect	A natural heating process that occurs when certain gases in Earth's atmosphere trap heat
	Natural Resources	Any natural substance that humans use can be considered a natural resource
	Electromagnetic Energy	the energy carried by electromagnetic waves often referred to as electromagnetic radiation


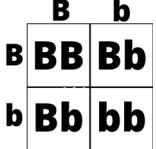
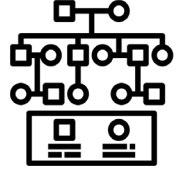
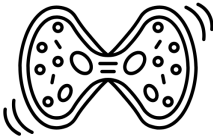
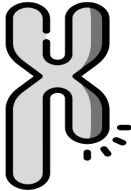

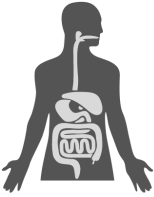



Visual	Term	Definition
	Wavelength	the distance between two similar points on waves that are next to each other
	Kinetic Energy	the energy an object has because of its motion
	Potential Energy	the stored energy that an object has because of its position or state
	Work	a force causing the movement, or displacement, of an object
	Power	a measure of the amount of work that can be done in a given amount of time
	Energy Transformation	the changing of energy from one type of energy to another
	Simple Machine	any of several devices with few or no moving parts that are used to make work easier
	Force	a push or a pull on an object
	Motion	the action of an object moving from one location to another location, changing position
	Mass	the measure of the amount of matter in an object
	Speed	the distance traveled divided by the time it takes the object to travel that distance



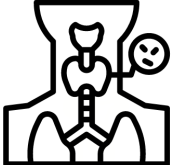
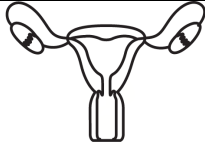



Visual	Term	Definition
	Velocity	the speed of an object and the direction of its motion
	Cell	the smallest part of any living thing
	Nucleus	directs the activity of a cell; it contains chromosomes with the DNA
	Autotroph	an organism that can produce its own food using light, water, carbon dioxide, or other chemicals, also called producers
	Homeostasis	an organism's ability to maintain internal stability to help compensate for changes in the environment; balance or equilibrium in the body
	Heterotroph	an organism that cannot produce its own food, instead gets its food and nutrition from other sources
	Reproduce	the process where living things produce offspring
	Binary Fission	reproduction where the organism splits into two identical halves
	Genetics	the study of how traits are inherited



Visual	Term	Definition
	Trait	a specific characteristic of an individual
	Punnett Square	a tool used to predict the number of times a certain trait will occur
	Pedigree	a tool used to trace a trait in members of a family over several generations
	Mitosis	the process in which the nucleus divides to form two identical nuclei
	Meiosis	the process of cell division that produces haploid cells
	Excretory System	body system that gets rid of extra wastes in the body, includes the urinary system
	Digestive System	body system that absorbs the food eaten and transforms it to energy and nutrients
	Skeletal System	the framework of bones in the body



Visual	Term	Definition
	Muscular System	the framework of muscles in the body
	Respiratory System	system that allows a person to breathe and exchange oxygen and carbon dioxide (CO2) throughout the body
	Endocrine System	body's network of glands, hormones and receptors
	Reproductive System	system in the body that contains sex organs and parts of the brain, that allow for the production of offspring
	Nervous System	system of nerves that carries electrical impulses throughout the body



Learning in Action: Grade Level Skills

Examples of Grade Level Skills

- Draw a diagram of the earth's atmosphere.
- Explain the atmosphere's importance to living things.
- Research and describe severe weather types.
- Compare weather and climate of different regions.
- Explain the importance of air quality and identify ways we can improve this.
- Summarize environmental issues and brainstorm ways to remediate them.
- Determine speed and velocity using a formula.
- Name cultural examples of energy transformations.
- Design a simple machine and explain how it works.
- Explain the major body systems. Stick to the key point of each.
- Explain how the environment impacts genetics with examples.
- Define force and motion with an example.
- Explain the difference between weight and mass. Tell how both weight and mass relate to gravity
- Explain how free-fall and air resistance are related to gravity, friction, and velocity.
- Create a timeline of the history of cells and cell theory, noting important events.
- Explain the life cycle of plants including adaptations.

Resources

Links and online resources to allow you to support your child's learning.

- [Khan Academy-Middle School Earth Science](#)
- [Khan Academy-Middle School Biology](#)
- [PBS Learning Media- Middle School Science](#)



- [#GoOpenNC](#)
- [National Geographic](#)
- [Crash Course Kids Science](#)

At-Home Connections

- Observe changes in weather together with your student.
- Watch the weather report together or discuss radar images from your phone's weather app. What do you notice about patterns? How does this connect to what we've learned in Science?
- Discuss severe weather preparedness and how alerts and weather forecasts help us prepare.
- If you travel, discuss changes in the atmosphere as you change elevations in the car or on an airplane.
- Point out climate regions you have visited or want to visit. How does the climate impact daily life in different regions of the country and the world?
- Talk about environmental issues such as recycling and how your choices impact the environment.
- Discuss energy use and ways to conserve energy within your home and community.
- Point out ways you use simple machines to make tasks easier.
- Talk about motion and speed in relation to recreational activities and vehicles. How do skateboards, bikes, and boats work? What impacts the speed of these?
- Point out varieties of plants and animals in your community and how they work together as an ecosystem. This could include wild areas near your home, an ant colony living in sidewalk cracks, or a fish tank in your home!
- Discuss similarities and differences within genetic families around you and of people that you know. Do you have neighbors whose children look alike or do you and a sibling have different traits?
- Ask how our life choices impact our genetics and lifespans.
- Discuss how our body systems work together. How do you feel differently when you eat and drink certain foods? How does that impact other systems?
- Talk about injuries you've had and have healed from. It's amazing how the human body works!
- Point out and discuss possible [science-related career choices](#).
- When sick, discuss how our immune system works and how we can help it work optimally.

Challenges to Anticipate

It's common for students to experience productive struggle when learning new things. Our brains are growing and changing so much during adolescence and each student will be in a different phase of development. Science covers a vast range of vocabulary and abstract topics. Students may struggle with



these concepts one year, and master them the next. Repeated practice using a website like [ixl.com/science](https://www.ixl.com/science) can help students cement new learning and revisit missed concepts from previous grade levels. Students may also need reteaching or pre-teaching using video sites like [Crash Course Kids Science](https://www.crashcoursekids.com/) or [PBS Learning Media- Middle School Science](https://www.pbslearningmedia.org/subject/science/). Discovering the world around them through Science can be exciting, but challenging. Pushing through this struggle will be worth it.

Communicating with Your Child's Teacher

Still feeling stuck? Reach out to your child's teacher to discuss what you can do further your child's learning. Some questions that might guide your discussion:

- What resources would you suggest I use to support my child?
- Where do you see my child struggling? What can we do together to help?
- What should my child practice at home?
- What collective message can we send together to help my child learn?

Need Technical Help?

Reach out to your student's home school for technical assistance. Include the type of device (PC, Mac, Chromebook, etc.) and browser (Chrome, Firefox, Safari, etc.).

Citations:

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