

Preschool

SCIENCE Standards (CDE 2020)

Preschool

Physical Science

<https://www.cde.state.co.us/apps/standards/7,1,15>

1. Recognize that physical properties of objects and/or materials help us understand the world.

RESOURCES:

http://wpafbstem.com/media/wow/diy_marble_print.pdf

http://wpafbstem.com/media/wow/diy_slime_time.pdf

2. Recognize there are cause - and - effect relationships related to matter and energy.

RESOURCES:

http://wpafbstem.com/media/wow/diy_burst_your_bubble.pdf

http://wpafbstem.com/media/wow/diy_hovercraft.pdf

http://wpafbstem.com/media/wow/diy_cool_chromatography.pdf

Life Science

<https://www.cde.state.co.us/apps/standards/7,1,16>

1. Recognize that living things have unique characteristics and basic needs that can be observed and studied.

RESOURCES:

http://wpafbstem.com/media/wow/diy_compost_challenge.pdf

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

2. Recognize that living things develop in predictable patterns.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Primary Flowering Plant Structures

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7,1,17>

1. The acquisition of concepts and facts related to the Earth materials and their uses.

RESOURCES:

http://wpafbstem.com/media/wow/diy_making_observations.pdf

http://wpafbstem.com/media/wow/diy_sizzling_solar_oven.pdf

2. The acquisition of concepts and facts related to the natural and physical world and the understanding of naturally occurring relationships.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Biomes 1,2, and 3

http://wpafbstem.com/media/wow/diy_marble_print.pdf
http://wpafbstem.com/media/wow/diy_candy_crystals.pdf
http://wpafbstem.com/media/wow/diy_magic_sand.pdf

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

***No Preschool Standards are listed in the NGSS**

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

Preschool

<https://www.cde.state.co.us/apps/standards/9,1,33>

1. Identify art in daily surroundings.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

http://wpafbstem.com/media/wow/diy_probability_penny.pdf

Preschool

<https://www.cde.state.co.us/apps/standards/4,1,8>

P.CC.A. Counting & Cardinality: Know number names and the count sequence.

P.CC.B. Counting & Cardinality: Recognize the number of objects in a small set.

P.CC.C. Counting & Cardinality: Understand the relationship between numbers and quantities.

P.CC.D. Counting & Cardinality: Compare numbers.

P.CC.E. Counting & Cardinality: Associate a quantity with written numerals up to 5 and begin to write numbers.

<https://www.cde.state.co.us/apps/standards/4,1,9>

P.OA.A. Operations & Algebraic Thinking: Understand addition as adding to and understand subtraction as taking away from.

P.OA.B. Operations & Algebraic Thinking: Understand simple patterns.

<https://www.cde.state.co.us/apps/standards/4,1,10>

P.MD.A. Measurement & Data: Measure objects by their various attributes using standard and nonstandard measurement and use differences in attributes to make comparisons.

<https://www.cde.state.co.us/apps/standards/4,1,11>

P.G.A. Geometry: Identify, describe, compare, and compose shapes.

P.G.B. Geometry: Explore the positions of objects in space.

Kindergarten

SCIENCE Standards (CDE 2020)

Kindergarten

Physical Science

<https://www.cde.state.co.us/apps/standards/7,2,15>

1. Pushes and pulls can have different strengths and directions, and can change the speed or direction of an object's motion or start or stop it.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Pushes and Pulls

http://wpafbstem.com/media/wow/diy_balancing_act.pdf

http://wpafbstem.com/media/wow/diy_hovercraft.pdf

2. Sunlight affects the Earth's surface.

RESOURCES:

http://wpafbstem.com/media/wow/diy_sunscreen_science.pdf

Life Science

<https://www.cde.state.co.us/apps/standards/7,2,16>

1. To live and grow, animals obtain food they need from plants or other animals, and plants need water and light.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Primary Flowering Plant Structures

http://wpafbstem.com/media/wow/diy_chlorophyll_chromatography.pdf

http://wpafbstem.com/media/wow/diy_compost_challenge.pdf

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7.2.17>

1. Patterns are observed when measuring the local weather, including how humans and other organisms impact their environment.

RESOURCES:

<https://www.pbs.org/parents/printables/my-weather-chart>

<https://pbskids.org/sid/games/weather-surprise>

2. Plants and animals meet their needs in their habitats and impact one another; people can prepare for severe weather.

RESOURCES

<https://www.pbs.org/parents/crafts-and-experiments/where-do-i-live>

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

Kindergarten

<https://www.nextgenscience.org/pe/k-ps2-2-motion-and-stability-forces-and-interactions>

Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*

RESOURCES:

http://wpafbstem.com/media/wow/diy_robotic_arm.pdf

<https://www.nextgenscience.org/pe/k-ess3-3-earth-and-human-activity>

Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*

RESOURCES:

<https://www.weather.gov/epz/education>

<https://www.nextgenscience.org/pe/k-ess3-3-earth-and-human-activity>

Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*

RESOURCES:

<https://www.nationalcleanupday.org/>

<https://www.nextgenscience.org/pe/k-2-ets1-1-engineering-design>

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

RESOURCES:

<https://www.youtube.com/playlist?list=PLhz12vamHOnZ4ZDC0dS6C9HRN5Qrm0jHO>

(Crash Course Kids - explaining the engineering design process)

<https://www.nextgenscience.org/pe/k-2-ets1-2-engineering-design>

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

RESOURCES:

http://wpafbstem.com/media/wow/diy_robotic_arm.pdf

<https://www.nextgenscience.org/pe/k-2-ets1-3-engineering-design>

Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

RESOURCES:

http://wpafbstem.com/media/wow/diy_parachute_planning.pdf

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

Kindergarten

<https://www.cde.state.co.us/apps/standards/9,2,33>

Identify how artists use visual art and design to communicate.

<https://www.cde.state.co.us/apps/standards/9,2,34>

Notice and discuss what can be seen in works of visual art and design.

<https://www.cde.state.co.us/apps/standards/9,2,35>

Investigate the properties of materials to support the planning and making of works of art.

<https://www.cde.state.co.us/apps/standards/9,2,36>

Recognize that artists and designers contribute and connect to their communities.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

Kindergarten

<https://www.cde.state.co.us/apps/standards/4,2,8>

K.CC.A. Counting & Cardinality: Use number names and the count sequence.

K.CC.B. Counting & Cardinality: Count to determine the number of objects.

K.CC.C. Counting & Cardinality: Compare numbers.

K.NBT.A. Number & Operations in Base Ten: Work with numbers 11–19 to gain foundations for place value.

<https://www.cde.state.co.us/apps/standards/4,2,9>

K.OA.A. Operations & Algebraic Thinking: Model and describe addition as putting together and adding to, and subtraction as taking apart and taking from, using objects or drawings.

<https://www.cde.state.co.us/apps/standards/4,2,10>

K.MD.A. Measurement & Data: Describe and compare measurable attributes.

K.MD.B. Measurement & Data: Classify objects and count the number of objects in each category.

<https://www.cde.state.co.us/apps/standards/4,2,11>

K.G.A. Geometry: Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

K.G.B. Geometry: Analyze, compare, create, and compose shapes.

First Grade

SCIENCE Standards (CDE 2020)

First Grade

Physical Science

<https://www.cde.state.co.us/apps/standards/7,3,15>

1. Sound can make matter vibrate and vibrating matter can make sound.

RESOURCES:

http://wpafbstem.com/media/wow/diy_musical_bottles.pdf

<https://www.pbs.org/parents/crafts-and-experiments/see-sound-waves>

Life Science

<https://www.cde.state.co.us/apps/standards/7,3,16>

1. All organisms have external parts that they use to perform daily functions.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Primary Flowering Plant Structures

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

2. Young organisms are very much, but not exactly, like their parents, and also resemble other organisms of the same kind.

RESOURCES:

<https://kids.nationalgeographic.com/explore/awesome-8-hub/baby-animals/>

<https://www.nationalgeographic.org/media/sonoran-babies/>

(this video is labeled for older students, however there are several opportunities to notice the standard listed above)

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7.3.17>

1. Patterns of movement of the sun, moon and stars as seen from Earth can be observed, described and predicted.

RESOURCES:

http://wpafbstem.com/media/wow/diy_sizzling_solar_oven.pdf

https://www.youtube.com/watch?v=Y0_GLKU0NEY

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

First Grade

<https://www.nextgenscience.org/pe/k-2-ets1-1-engineering-design>

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

RESOURCES:

<https://www.youtube.com/playlist?list=PLhz12vamHOnZ4ZDC0dS6C9HRN5Qrm0jHO>

(Crash Course Kids - explaining the engineering design process)

<https://www.nextgenscience.org/pe/k-2-ets1-2-engineering-design>

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

RESOURCES:

http://wpafbstem.com/media/wow/diy_robotic_arm.pdf

<https://www.nextgenscience.org/pe/k-2-ets1-3-engineering-design>

Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

RESOURCES:

http://wpafbstem.com/media/wow/diy_filter_fun.pdf

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

First Grade

<https://www.cde.state.co.us/apps/standards/9.3.33>

Investigate how visual art and design tell the many stories of people, places or things.

<https://www.cde.state.co.us/apps/standards/9.3.34>

Question and respond to the stories told and the feelings expressed in works of visual art and design.

<https://www.cde.state.co.us/apps/standards/9.3.35>

Investigate the properties of materials to support the planning and making of works of art to communicate.

<https://www.cde.state.co.us/apps/standards/9.3.36>

Identify how artists and designers make connections through personal stories between self, family and friends.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

http://wpafbstem.com/media/wow/diy_probability_penny.pdf

First Grade

<https://www.cde.state.co.us/apps/standards/4.3.8>

1.NBT.A. Number & Operations in Base Ten: Extend the counting sequence.

1.NBT.B. Number & Operations in Base Ten: Understand place value.

1.NBT.C. Number & Operations in Base Ten: Use place value understanding and properties of operations to add and subtract.

<https://www.cde.state.co.us/apps/standards/4.3.9>

1.OA.A. Operations & Algebraic Thinking: Represent and solve problems involving addition and subtraction.

1.OA.B. Operations & Algebraic Thinking: Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.C. Operations & Algebraic Thinking: Add and subtract within 20.

1.OA.D. Operations & Algebraic Thinking: Work with addition and subtraction equations.

<https://www.cde.state.co.us/apps/standards/4,3,10>

1.MD.A. Measurement & Data: Measure lengths indirectly and by iterating length units.

1.MD.B. Measurement & Data: Tell and write time.

1.MD.C. Measurement & Data: Represent and interpret data.

<https://www.cde.state.co.us/apps/standards/4,3,11>

1.G.A. Geometry: Reason with shapes and their attributes.

Second Grade SCIENCE Standards (CDE 2020) Second Grade

Physical Science

<https://www.cde.state.co.us/apps/standards/7,4,15>

1. Matter exists as different substances that have observable different properties.

RESOURCES:

http://wpafbstem.com/media/wow/diy_float_your_boat.pdf

http://wpafbstem.com/media/wow/diy_rainbow_density.pdf

http://wpafbstem.com/media/wow/diy_burst_your_bubble.pdf

http://wpafbstem.com/media/wow/diy_candy_crystals.pdf

http://wpafbstem.com/media/wow/diy_making_observations.pdf

Life Science

<https://www.cde.state.co.us/apps/standards/7,4,16>

1. Plants depend on water and light to grow and on animals for pollination or to move their seeds around.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Primary Flowering Plant Structures

http://wpafbstem.com/media/wow/diy_chlorophyll_chromatography.pdf

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

2. A range of different organisms lives in different places.

RESOURCES:

http://wpafbstem.com/media/wow/diy_compost_challenge.pdf

[Free Interactive Science & Engineering Google Slides](#) - look for Biomes 1,2,and 3

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7,4,17>

1. Some events on Earth occur quickly; others can occur very slowly.

RESOURCES:

<https://www.nationalgeographic.org/photo/tungurahua/>

<https://www.youtube.com/watch?v=R-lak3Wvh9c>

2. Wind and water can change the shape of the land; models can show the shape and these changes to the land.

RESOURCES:

http://wpafbstem.com/media/wow/diy_rock_cycle_research.pdf

http://wpafbstem.com/media/wow/diy_water_works.pdf

http://wpafbstem.com/media/wow/diy_erosion_experiment.pdf

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

Second Grade

<https://www.nextgenscience.org/pe/2-ls2-2-ecosystems-interactions-energy-and-dynamics>

Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*

RESOURCES:

http://www.njagsociety.org/uploads/1/7/0/5/17057112/pollination_-_a_sticky_situation_lesson_plan.pdf

<https://www.nextgenscience.org/pe/2-ess2-1-earths-systems>

Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*

RESOURCES:

<https://www.covington.kyschools.us/userfiles/15/My%20Files/2nd%20add%20chg/2-ESS1-1%20pdf%20upload/erosion%20and%20weathering.pdf?id=3159>

<https://www.nextgenscience.org/pe/k-2-ets1-1-engineering-design>

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

RESOURCES:

<https://www.youtube.com/playlist?list=PLhz12vamHOnZ4ZDC0dS6C9HRN5Qrm0jHO>

(Crash Course Kids - explaining the engineering design process)

http://wpafbstem.com/media/wow/diy_filter_fun.pdf

<https://www.nextgenscience.org/pe/k-2-ets1-2-engineering-design>

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

RESOURCES:

http://wpafbstem.com/media/wow/diy_parachute_planning.pdf

<https://www.nextgenscience.org/pe/k-2-ets1-3-engineering-design>

Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

RESOURCES:

http://wpafbstem.com/media/wow/diy_building_bridges.pdf

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

Second Grade

<https://www.cde.state.co.us/apps/standards/9,4,33>

Identify how artists make choices using the language of visual art and design to communicate ideas.

<https://www.cde.state.co.us/apps/standards/9,4,34>

Share and explain choices made and possible next steps in personal works of visual art and design.

<https://www.cde.state.co.us/apps/standards/9,4,35>

Plan and create works of art by exploring various media and creating meaning through symbolization.

<https://www.cde.state.co.us/apps/standards/9,4,36>

Observe and discuss how visual art and design are evident in the everyday life of communities.

Second Grade

<https://www.cde.state.co.us/apps/standards/4,4,8>

2.NBT.A. Number & Operations in Base Ten: Understand place value.

2.NBT.B. Number & Operations in Base Ten: Use place value understanding and properties of operations to add and subtract.

<https://www.cde.state.co.us/apps/standards/4,4,9>

2.OA.A. Operations & Algebraic Thinking: Represent and solve problems involving addition and subtraction.

2.OA.B. Operations & Algebraic Thinking: Add and subtract within 20.

2.OA.C. Operations & Algebraic Thinking: Work with equal groups of objects to gain foundations for multiplication.

<https://www.cde.state.co.us/apps/standards/4,4,10>

2.MD.A. Measurement & Data: Measure and estimate lengths in standard units.

2.MD.B. Measurement & Data: Relate addition and subtraction to length.

2.MD.C. Measurement & Data: Work with time and money.

2.MD.D. Measurement & Data: Represent and interpret data.

<https://www.cde.state.co.us/apps/standards/4,4,11>

2.G.A. Geometry: Reason with shapes and their attributes.

Third Grade SCIENCE Standards (CDE 2020)

Third Grade Physical Science

<https://www.cde.state.co.us/apps/standards/7,5,15>

1. Patterns of motion can be used to predict future motion.

RESOURCES:

http://wpafbstem.com/media/wow/diy_hovercraft.pdf

http://wpafbstem.com/media/wow/diy_catapult_chaos.pdf

http://wpafbstem.com/media/wow/diy_superb_spin.pdf

2. Objects in contact exert forces on each other; electric and magnetic forces between a pair of objects do not require contact.

RESOURCES:

http://wpafbstem.com/media/wow/diy_balancing_act.pdf

http://wpafbstem.com/media/wow/diy_simple_magnetic_motor.pdf

http://wpafbstem.com/media/wow/diy_marble_print.pdf

Life Science

<https://www.cde.state.co.us/apps/standards/7,5,16>

1. Organisms have unique and diverse life cycles.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Flowering Plant Structures

http://wpafbstem.com/media/wow/diy_budding_bacteria.pdf

2. Being part of a group helps animals obtain food, defend themselves and cope with changes.

RESOURCES:

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

3. Different organisms vary in how they look and function because they have different inherited information; the environment also affects the traits that an organism develops.

RESOURCES:

<https://www.nationalgeographic.org/activity/bioluminescence-living-light/>

<https://www.nationalgeographic.org/activity/habitat-needs/>

4. Some living organisms resemble organisms that once lived on Earth.

<https://www.nps.gov/flfo/learn/virtually-experience-florissant-fossil-beds.htm>

5. Sometimes differences in characteristics between individuals of the same species provide advantages in survival and reproduction.

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7.5.17>

1. Climate describes patterns of typical weather conditions over different scales and variations; historical weather patterns can be analyzed.

RESOURCES:

http://wpafbstem.com/media/wow/diy_windy_weather.pdf

<https://www.nationalgeographic.org/activity/measuring-weather-with-tools/>

<https://www.nationalgeographic.org/article/weather-or-climate-whats-difference/>

2. A variety of weather hazards result from natural processes; humans cannot eliminate weather-related hazards but can reduce their impacts.

https://www.nationalgeographic.org/topics/resource-library-catastrophic-weather-events/?q=&page=1&per_page=25

(The articles here may be too complex for third graders to read, but the pictures will enhance the understanding of this concept.)

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

Third Grade

<https://www.nextgenscience.org/pe/3-5-ets1-1-engineering-design>

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

RESOURCES:

<https://www.youtube.com/playlist?list=PLhz12vamHOnZ4ZDC0dS6C9HRN5Qrm0jHO>

(Crash Course Kids - explaining the engineering design process)

<https://www.nextgenscience.org/pe/3-5-ets1-2-engineering-design>

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

RESOURCES:

http://wpafbstem.com/media/wow/diy_filter_fun.pdf

<https://www.nextgenscience.org/pe/3-5-ets1-3-engineering-design>

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

RESOURCES:

http://wpafbstem.com/media/wow/diy_building_bridges.pdf

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

Fourth Grade

<https://www.cde.state.co.us/apps/standards/9.6.33>

1. Uncover how artistic intent can be enhanced through the use of the language of visual art and design.

2. Respond to an artist's point of view being mindful of historical, contemporary and cultural context.

<https://www.cde.state.co.us/apps/standards/9.6.34>

1. Interpret and evaluate personal work and the work of others with informed criteria.

2. Synthesize researched and visual information to imagine, inform and plan possible next steps in personal artmaking.

<https://www.cde.state.co.us/apps/standards/9.6.35>

1. Investigate ideas of personal interest to plan and create works of visual art and design.

2. Utilize media in traditional and inventive ways to communicate personal intent.

<https://www.cde.state.co.us/apps/standards/9.6.36>

Investigate and discuss how diverse communities address issues relevant to their culture, place and times.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

http://wpafbstem.com/media/wow/diy_probability_penny.pdf

Third Grade

<https://www.cde.state.co.us/apps/standards/4,5,8>

3.NBT.A. Number & Operations in Base Ten: Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of algorithms may be used.

3.NF.A. Number & Operations—Fractions: Develop understanding of fractions as numbers.

<https://www.cde.state.co.us/apps/standards/4,5,9>

3.OA.A. Operations & Algebraic Thinking: Represent and solve problems involving multiplication and division.

3.OA.B. Operations & Algebraic Thinking: Apply properties of multiplication and the relationship between multiplication and division.

3.OA.C. Operations & Algebraic Thinking: Multiply and divide within 100.

3.OA.D. Operations & Algebraic Thinking: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

<https://www.cde.state.co.us/apps/standards/4,5,10>

3.MD.A. Measurement & Data: Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

3.MD.B. Measurement & Data: Represent and interpret data.

3.MD.C. Measurement & Data: Geometric measurement: Use concepts of area and relate area to multiplication and to addition.

3.MD.D. Measurement & Data: Geometric measurement: Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

<https://www.cde.state.co.us/apps/standards/4,5,11>

3.G.A. Geometry: Reason with shapes and their attributes.

Fourth Grade SCIENCE Standards (CDE 2020) Fourth Grade

Physical Science

<https://www.cde.state.co.us/apps/standards/7.6.15>

1. The faster an object moves the more energy it has.

RESOURCES:

http://wpafbstem.com/media/wow/diy_hovercraft.pdf

http://wpafbstem.com/media/wow/diy_superb_spin.pdf

2. Energy can be moved from place to place.

RESOURCES:

http://wpafbstem.com/media/wow/diy_simple_magnetic_motor.pdf

3. When objects collide contact forces transfer so as to change objects' motion.

RESOURCES:

<https://www.exploratorium.edu/tinkering/projects/chain-reaction>

4. Energy can be produced, used or released by converting stored energy.

RESOURCES:

http://wpafbstem.com/media/wow/diy_catapult_chaos.pdf

5. Waves are regular patterns of motion.

RESOURCES:

http://wpafbstem.com/media/wow/diy_musical_bottles.pdf

6. An object can be seen when light reflected from its surface enters the eyes.

RESOURCES:

<https://www.lovemyscience.com/bouncingspotlight.html>

7. Patterns can encode, send, receive and decode information.

RESOURCES:

<https://www.fizzicseducation.com.au/150-science-experiments/mathematics/morse-code-detective/>

Life Science

<https://www.cde.state.co.us/apps/standards/7.6.16>

1. Organisms have both internal and external structures that serve various functions.

RESOURCES:

[Free Interactive Science & Engineering Google Slides](#) - look for Flowering Plants Structures

http://wpafbstem.com/media/wow/diy_chlorophyll_chromatography.pdf

http://wpafbstem.com/media/wow/diy_lung.pdf

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7.6.17>

1. Earth has changed over time.

RESOURCES:

http://wpafbstem.com/media/wow/diy_rock_cycle_research.pdf

2. Four major earth systems interact.

RESOURCES:

http://wpafbstem.com/media/wow/diy_water_works.pdf

<https://www.nationalgeographic.org/encyclopedia/water-cycle/>

3. Earth's physical features occur in patterns.

RESOURCES:

http://wpafbstem.com/media/wow/diy_erosion_experiment.pdf

4. Energy and fuels that humans use are derived from natural sources and their use affects the environment in multiple ways.

RESOURCES:

http://wpafbstem.com/media/wow/diy_sizzling_solar_oven.pdf

<https://www.nationalgeographic.org/media/fort-worth-gas-waste-and-water/>

<https://www.nationalgeographic.org/encyclopedia/air-pollution/>

5. A variety of hazards result from natural processes; humans cannot eliminate natural hazards but can reduce their impacts' effect.

<https://www.nationalgeographic.org/encyclopedia/air-pollution/>

https://www.nationalgeographic.org/topics/resource-library-catastrophic-weather-events/?q=&page=1&per_page=25

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

Fourth Grade

<https://www.nextgenscience.org/pe/4-ps3-4-energy>

Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*

RESOURCES:

<https://www.instructables.com/id/Build-a-Mousetrap-Car/>

<https://www.exploratorium.edu/snacks/modulated-led>

<https://www.exploratorium.edu/snacks/palm-pipes>

<https://www.nextgenscience.org/pe/4-ps4-3-waves-and-their-applications-technologies-information-transfer>

Generate and compare multiple solutions that use patterns to transfer information.*

RESOURCES:

http://experimentexchange.com/physics_force-energy-motion/experiment-with-morse-code/

(and then have students try to improve upon Morse code and/or send messages using their code)

http://wpafbstem.com/media/wow/diy_coding_with_cards.pdf

<https://www.nextgenscience.org/pe/4-ess3-2-earth-and-human-activity>

Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*

RESOURCES:

<https://www.sciencebuddies.org/stem-activities/soil-and-earthquakes>

<https://www.nextgenscience.org/pe/3-5-ets1-1-engineering-design>

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

<https://www.youtube.com/playlist?list=PLhz12vamHOnZ4ZDC0dS6C9HRN5Qrm0jHO>

(Crash Course Kids - explaining the engineering design process)

<https://www.nextgenscience.org/pe/3-5-ets1-2-engineering-design>

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

RESOURCES:

http://wpafbstem.com/media/wow/diy_filter_fun.pdf

<https://www.nextgenscience.org/pe/3-5-ets1-3-engineering-design>

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

RESOURCES:

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

Fourth Grade

<https://www.cde.state.co.us/apps/standards/9,6,33>

1. Uncover how artistic intent can be enhanced through the use of the language of visual art and design.

2. Respond to an artist's point of view being mindful of historical, contemporary and cultural context.

<https://www.cde.state.co.us/apps/standards/9,6,34>

1. Interpret and evaluate personal work and the work of others with informed criteria.

2. Synthesize researched and visual information to imagine, inform and plan possible next steps in personal artmaking.

<https://www.cde.state.co.us/apps/standards/9,6,35>

1. Investigate ideas of personal interest to plan and create works of visual art and design.

2. Utilize media in traditional and inventive ways to communicate personal intent.

<https://www.cde.state.co.us/apps/standards/9,6,36>

Investigate and discuss how diverse communities address issues relevant to their culture, place and times.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

http://wpafbstem.com/media/wow/diy_probability_penny.pdf

Fourth Grade

<https://www.cde.state.co.us/apps/standards/4,6,8>

4.NBT.A. Number & Operations in Base Ten: Generalize place value understanding for multi-digit whole numbers.

4.NBT.B. Number & Operations in Base Ten: Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.NF.A. Number & Operations—Fractions: Extend understanding of fraction equivalence and ordering.

4.NF.B. Number & Operations—Fractions: Build fractions from unit fractions.

4.NF.C. Number & Operations—Fractions: Use decimal notation for fractions, and compare decimal fractions.

<https://www.cde.state.co.us/apps/standards/4,6,9>

4.OA.A. Operations & Algebraic Thinking: Use the four operations with whole numbers to solve problems.

4.OA.B. Operations & Algebraic Thinking: Gain familiarity with factors and multiples.

4.OA.C. Operations & Algebraic Thinking: Generate and analyze patterns.

<https://www.cde.state.co.us/apps/standards/4,6,10>

4.MD.A. Measurement & Data: Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit

4.MD.B. Measurement & Data: Represent and interpret data.

4.MD.C. Measurement & Data: Geometric measurement: Understand concepts of angle and measure angles.

<https://www.cde.state.co.us/apps/standards/4,6,11>

4.G.A. Geometry: Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

SCIENCE Standards (CDE 2020)

Fifth Grade

Physical Science

<https://www.cde.state.co.us/apps/standards/7,7,15>

1. Matter exists as particles that are too small to be seen; measurements of a variety of observable properties can be used to identify particular materials.

RESOURCES:

http://wpafbstem.com/media/wow/diy_float_your_boat.pdf

http://wpafbstem.com/media/wow/diy_rainbow_density.pdf

http://wpafbstem.com/media/wow/diy_candy_crystals.pdf

http://wpafbstem.com/media/wow/diy_marble_print.pdf

http://wpafbstem.com/media/wow/diy_cool_chromatography.pdf

http://wpafbstem.com/media/wow/diy_density_diversions.pdf

2. Chemical Reactions that occur when substances are mixed can be identified by the emergence of substances with different properties; the total mass remains the same.

RESOURCES:

http://wpafbstem.com/media/wow/diy_invisible%20ink.pdf

http://wpafbstem.com/media/wow/diy_ph_indicator.pdf

http://wpafbstem.com/media/wow/diy_slime_time.pdf

http://wpafbstem.com/media/wow/diy_eggcellent_experiment.pdf

3. The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.

RESOURCES:

http://wpafbstem.com/media/wow/diy_balancing_act.pdf

http://wpafbstem.com/media/wow/diy_catapult_chaos.pdf

4. The energy released from food was once energy from the sun.

<https://www.generationgenius.com/food-energy-basics-lesson-for-kids/>

Life Science

<https://www.cde.state.co.us/apps/standards/7.7.16>

1. Plants acquire their material from growth chiefly from air and water.

RESOURCES:

http://wpafbstem.com/media/wow/diy_chlorophyll_chromatography.pdf

2. Matter cycles between air and soil and among plants, animals and microbes as these organisms live and die.

RESOURCES:

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

[Free Interactive Science & Engineering Google Slides](#) - look for Flowering Plant Structures

http://wpafbstem.com/media/wow/diy_compost_challenge.pdf

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7.7.17>

1. Stars range greatly in size and distance from Earth, and this can explain their relative brightness.

2. Earth's orbit and rotation and the orbit of the moon around earth cause observable patterns.

RESOURCES:

https://www.discoverspace.org/video_lesson/creating-your-space-phases-of-the-moon/

3. Earth's major systems interact in multiple ways to affect Earth's surface materials and processes.

RESOURCES:

http://wpafbstem.com/media/wow/diy_erosion_experiment.pdf

https://www.nationalgeographic.org/topics/resource-library-catastrophic-weather-events/?q=&page=1&per_page=25

4. Most of Earth's water is in the ocean and much of Earth's freshwater in glaciers or underground.

RESOURCES:

http://wpafbstem.com/media/wow/diy_water_works.pdf

<https://www.nationalgeographic.org/encyclopedia/water-cycle/>

5. Societal activities have had major effects on land, ocean, atmosphere and even outer space.

RESOURCES:

<https://www.nationalgeographic.org/encyclopedia/great-pacific-garbage-patch/>

<https://www.nationalgeographic.org/encyclopedia/climate-change/>

<https://www.nationalgeographic.org/encyclopedia/drought/>

<https://www.nationalgeographic.org/media/fort-worth-gas-waste-and-water/>

<https://www.nationalgeographic.org/media/cleaning-poop-drinking-water/>

<https://www.nationalgeographic.org/encyclopedia/wildfires/>

<https://www.nationalgeographic.org/interactive/humans-induce-and-reduce-environmental-disasters/>

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

Fifth Grade

<https://www.nextgenscience.org/pe/3-5-ets1-1-engineering-design>

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

RESOURCES:

<https://www.youtube.com/playlist?list=PLhz12vamHOnZ4ZDC0dS6C9HRN5Qrm0jHO>

(Crash Course Kids - explaining the engineering design process)

<https://www.nextgenscience.org/pe/3-5-ets1-2-engineering-design>

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

RESOURCES:

http://wpafbstem.com/media/wow/diy_building_bridges.pdf

<https://www.nextgenscience.org/pe/3-5-ets1-3-engineering-design>

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

RESOURCES:

http://wpafbstem.com/media/wow/diy_building_bridges.pdf

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

Fifth Grade

<https://www.cde.state.co.us/apps/standards/9.7.33>

1. Investigate and analyze how specific points of view can be communicated through the language of visual art and design.

2. Demonstrate an understanding of how works of visual art and design are influenced by the culture of daily life.

<https://www.cde.state.co.us/apps/standards/9,7,34>

1. Using a variety of criteria, question and evaluate works of art.

2. Visualize intended meaning and determine a method of planning that best supports personal artmaking.

<https://www.cde.state.co.us/apps/standards/9,7,35>

1. Plan works of visual art and design where intended meaning is communicated to viewers.

2. Apply an understanding of art processes and studio skills to create works of art and design.

<https://www.cde.state.co.us/apps/standards/9,7,36>

1. Using interdisciplinary knowledge, investigate and interpret how diverse communities address issues relevant to their place and times.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

http://wpafbstem.com/media/wow/diy_probability_penny.pdf

Fifth Grade

<https://www.cde.state.co.us/apps/standards/4,7,8>

5.NBT.A. Number & Operations in Base Ten: Understand the place value system.

5.NBT.B. Number & Operations in Base Ten: Perform operations with multi-digit whole numbers and with decimals to hundredths.

5.NF.A. Number & Operations—Fractions: Use equivalent fractions as a strategy to add and subtract fractions.

5.NF.B. Number & Operations—Fractions: Apply and extend previous understandings of multiplication and division.

<https://www.cde.state.co.us/apps/standards/4,7,9>

5.OA.A. Operations & Algebraic Thinking: Write and interpret numerical expressions.

5.OA.B. Operations & Algebraic Thinking: Analyze patterns and relationships.

<https://www.cde.state.co.us/apps/standards/4,7,10>

5.MD.A. Measurement & Data: Convert like measurement units within a given measurement system.

5.MD.B. Measurement & Data: Represent and interpret data.

5.MD.C. Measurement & Data: Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition

<https://www.cde.state.co.us/apps/standards/4,7,11>

5.G.A. Geometry: Graph points on the coordinate plane to solve real-world and mathematical problems.

5.G.B. Geometry: Classify two-dimensional figures into categories based on their properties.

RESOURCES:

Middle School - 6th, 7th, and 8th grades SCIENCE Standards (CDE 2020)

Middle School

Physical Science

<https://www.cde.state.co.us/apps/standards/7,38,15>

1. The fact that matter is composed of atoms and molecules can be used to explain the properties of substances, diversity of materials, states of matter and phases changes.

RESOURCES:

<https://phet.colorado.edu/en/simulation/legacy/build-a-molecule>

<https://phet.colorado.edu/en/simulation/build-an-atom>

<https://phet.colorado.edu/en/simulation/states-of-matter-basics>

2. Reacting substances rearrange to form different molecules, but the number of atoms is conserved. Some reactions release energy and others absorb energy.

RESOURCES:

http://wpafbstem.com/media/wow/diy_ph_indicator.pdf

<https://phet.colorado.edu/en/simulation/acid-base-solutions>

<https://phet.colorado.edu/en/simulation/legacy/reactions-and-rates>

3. Motion is described relative to a reference frame that must be shared with others and is determined by the sum of the forces acting on it. The greater the mass of the object, the greater the force needed to achieve the same change in motion.

RESOURCES:

http://wpafbstem.com/media/wow/diy_hovercraft.pdf

http://wpafbstem.com/media/wow/diy_catapult_chaos.pdf

4. Forces that act at a distance (gravitational, electric, and magnetic) can be explained by force fields that extend through space and can be mapped by their effect on a test object.

RESOURCES:

https://www.openscienced.org/8-3-forces-distance-overview/?mc_cid=3c213ffea5&mc_eid=a46e2d3dd4

http://wpafbstem.com/media/wow/diy_balancing_act.pdf

5. Kinetic energy can be distinguished from the various forms of potential energy.

RESOURCES:

http://wpafbstem.com/media/wow/diy_catapult_chaos.pdf

http://wpafbstem.com/media/wow/diy_superb_spin.pdf

6. Energy changes to and from each type can be tracked through physical or chemical interactions. The relationship between the temperature and the total energy of a system depends on the types, states and amounts of matter.

RESOURCES:

<https://www.openscienced.org/6-2-thermal-energy-overview/>

http://wpafbstem.com/media/wow/diy_eggccellent_experiment.pdf

7. When two objects interact, each one exerts a force on the other that can cause energy to be transferred to and from the object.

RESOURCES:

http://wpafbstem.com/media/wow/diy_catapult_chaos.pdf

https://www.openscienced.org/8-3-forces-distance-overview/?mc_cid=3c213ffea5&mc_eid=a46e2d3dd4

8. A simple wave model has a repeating pattern with specific wavelength, frequency, and amplitude and mechanical waves need a medium through which they are transmitted. This model can explain many phenomena which include light and sound.

RESOURCES:

http://wpafbstem.com/media/wow/diy_simple_spectrometer.pdf

http://wpafbstem.com/media/wow/diy_musical_bottles.pdf

9. A wave model of light is useful to explain how light interacts with objects through a variety of properties.

RESOURCES:

http://wpafbstem.com/media/wow/diy_lasers_lenses.pdf

10. Designed technologies can transmit digital information as wave pulses.

Life Science

<https://www.cde.state.co.us/apps/standards/7.38.16>

1. All living things are made up of cells, which is the smallest unit that can be said to be alive.

RESOURCES:

http://wpafbstem.com/media/wow/diy_budding_bacteria.pdf

2. Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring.

3. Sustaining life requires substantial energy and matter inputs.

RESOURCES:

http://wpafbstem.com/media/wow/diy_chlorophyll_chromatography.pdf

http://wpafbstem.com/media/wow/diy_compost_challenge.pdf

4. Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain.

RESOURCES:

http://wpafbstem.com/media/wow/diy_reaction_time.pdf

<https://www.openscienced.org/instructional-materials/7-3-metabolic-reactions/>

5. Organisms and populations of organisms are dependent on their environmental interactions both with other living things and with nonliving factors.

RESOURCES:

http://wpafbstem.com/media/wow/DIY_infectious_incident.pdf

http://wpafbstem.com/media/wow/diy_observing_osmosis.pdf

6. Ecosystems are sustained by the continuous flow of energy, originating primarily from the sun, and the recycling of matter and nutrients within the system.

RESOURCES:

http://wpafbstem.com/media/wow/diy_%20nature_adventure.pdf

7. Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all of its populations.

RESOURCES:

<https://www.nationalgeographic.org/encyclopedia/ecosystem/>

<https://www.nationalgeographic.org/encyclopedia/oceanography/>

8. Heredity explains why offspring resemble, but are not identical to, their parents and is a unifying biological principle. Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes.

RESOURCES:

<https://ed.ted.com/search?q=genetics>

<https://www.exploratorium.edu/snacks/subject/genetics>

9. Fossils are mineral replacements, preserved remains, or traces of organisms that lived in the past.

RESOURCES:

<https://www.sciencenewsforstudents.org/?s=fossils>

10. Genetic variations among individuals in a population give some individuals an advantage in surviving and reproducing in their environment.

RESOURCES:

<https://www.exploratorium.edu/snacks/subject/genetics>

11. Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions.

RESOURCES:

<https://www.nationalgeographic.org/encyclopedia/adaptation/>

12. Biodiversity is the wide range of existing life forms that have adapted to the variety of conditions on Earth, from terrestrial to marine ecosystems.

RESOURCES:

<https://ed.ted.com/lessons/why-is-biodiversity-so-important-kim-preshoff>

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7.38.17>

1. Motion is predictable in both solar systems and galaxies.

RESOURCES:

<https://phet.colorado.edu/en/simulation/gravity-and-orbits>

2. The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.

RESOURCES:

<https://phet.colorado.edu/en/simulation/gravity-and-orbits>

<https://medium.com/science-friday-spoonfuls/search?q=solar%20system>

3. Rock strata and the fossil record can be used as evidence to organize the relative occurrence of major historical events in Earth's history.

RESOURCES:

http://wpafbstem.com/media/wow/diy_rock_cycle_research.pdf

4. Energy flows and matter cycles within and among Earth's systems, including the sun and Earth's interior as primary energy sources. Plate tectonics is one result of these processes.

RESOURCES:

http://wpafbstem.com/media/wow/diy_erosion_experiment.pdf

5. Plate tectonics is the unifying theory that explains movements of rocks at Earth's surface and geological history.

RESOURCES:

<https://phet.colorado.edu/en/simulation/legacy/plate-tectonics>

https://www.usgs.gov/natural-hazards/earthquake-hazards/science/earthquake-animations?qt-science_center_objects=7#qt-science_center_objects

6. Water cycles among land, ocean, and atmosphere, and is propelled by sunlight and gravity. Density variations of sea water drive interconnected ocean currents. Water movement causes weathering and erosion, changing landscape features.

RESOURCES:

http://wpafbstem.com/media/wow/diy_water_works.pdf

<https://www.nationalgeographic.org/encyclopedia/water-cycle/>

7. Complex interactions determine local weather patterns and influence climate, including the role of the ocean.

RESOURCES:

http://wpafbstem.com/media/wow/diy_windy_weather.pdf

https://www.nationalgeographic.org/topics/resource-library-catastrophic-weather-events/?q=&page=1&per_page=25

<https://www.nationalgeographic.org/article/weather-or-climate-whats-difference/>

8. Humans depend on Earth's land, ocean, atmosphere, and biosphere for different resources, many of which are limited or not renewable. Resources are distributed unevenly around the planet as a result of past geologic processes.

RESOURCES:

<https://www.nationalgeographic.org/media/fort-worth-gas-waste-and-water/>

9. Mapping the history of natural hazards in a region and understanding related geological forces.

RESOURCES:

<https://pubs.usgs.gov/gip/105/>

<https://www.usgs.gov/media/videos/volcano-web-shorts-3-seismology>

<https://www.usgs.gov/media/videos/yellowstone-eruptions-part-3-3>

10. Human activities have altered the biosphere, sometimes damaging it, although changes to environments can have different impacts for different living things.

RESOURCES:

<https://www.nationalgeographic.org/encyclopedia/great-pacific-garbage-patch/>

<https://www.nationalgeographic.org/activity/preventing-bad-air-days/>

<https://www.nationalgeographic.org/media/cleaning-poop-drinking-water/>

<https://www.nationalgeographic.org/encyclopedia/air-pollution/>

<https://www.nationalgeographic.org/encyclopedia/wildfires/>

<https://www.nationalgeographic.org/interactive/humans-induce-and-reduce-environmental-disasters/>

11. Human activities affect global warming. Decisions to reduce the impact of global warming depend on understanding climate science, engineering capabilities, and social dynamics.

RESOURCES:

<https://www.nationalgeographic.org/encyclopedia/climate-change/>

<https://www.nationalgeographic.org/encyclopedia/drought/>

<https://www.nationalgeographic.org/encyclopedia/air-pollution/>
<https://www.nationalgeographic.org/encyclopedia/wildfires/>

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

Middle School

<https://www.nextgenscience.org/pe/ms-ps1-6-matter-and-its-interactions>

Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.*

RESOURCES:

<https://www.nextgenscience.org/pe/ms-ps3-3-energy>

Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*

RESOURCES:

https://www.teachengineering.org/activities/view/duk_solaroven_tech_act

<https://www.nextgenscience.org/pe/ms-ls2-5-ecosystems-interactions-energy-and-dynamics>

Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*

RESOURCES:

https://www.teachengineering.org/activities/view/usf_stormwater_lesson02_activity3

<https://www.nextgenscience.org/pe/ms-ets1-1-engineering-design>

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

RESOURCES:

https://www.teachengineering.org/activities/view/wpi_amusement_park_ride

<https://www.nextgenscience.org/pe/ms-ets1-2-engineering-design>

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

RESOURCES:

https://www.teachengineering.org/activities/view/wpi_crutches_activity

<https://www.nextgenscience.org/pe/ms-ets1-3-engineering-design>

Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

RESOURCES:

https://www.teachengineering.org/activities/view/cub_obi_activity1

<https://www.nextgenscience.org/pe/ms-ets1-4-engineering-design>

Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

RESOURCES:

https://www.teachengineering.org/activities/view/wpi_crutches_activity

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

Sixth Grade

<https://www.cde.state.co.us/apps/standards/9,8,33>

1. Apply the language of visual art and design to distinguish and differentiate meanings.
2. Compare art from various historical, contemporary and cultural sources.
3. Utilize key concepts, issues and themes to connect the visual arts to other disciplines.

<https://www.cde.state.co.us/apps/standards/9,8,34>

1. Interpret meaning and evaluate works of visual art and design recognizing diverse points of view.
2. Describe, analyze and interpret works of art using specific art vocabulary.

<https://www.cde.state.co.us/apps/standards/9,8,35>

1. Plan the creation of a work of art utilizing feedback.
2. Explore various media, materials and techniques used to create works of visual art and design.
3. Utilize current and available technology to refine ideas in works of art.

<https://www.cde.state.co.us/apps/standards/9,8,36>

1. Infer from works of visual art and design, using interdisciplinary knowledge, how diverse communities address issues relevant to their culture, place and times.
2. Investigate art and other careers that use creative and design thinking.
3. Investigate how art addresses contemporary issues and community and societal concerns.

Seventh Grade

<https://www.cde.state.co.us/apps/standards/9,9,33>

1. Analyze works of art and apply the language of visual art and design to infer meaning.
2. Recognize and interpret works of art through the lens of time, place and culture.
3. Employ concepts, issues and themes from other disciplines to solve visual arts problems.

<https://www.cde.state.co.us/apps/standards/9,9,34>

1. Determine meaning from works of art and design using visual literacy skills such as interpretation, negotiation, appreciation and selection.
2. Utilize appropriate vocabulary in the critical analysis of works of art.

<https://www.cde.state.co.us/apps/standards/9,9,35>

1. Plan, anticipate outcomes and use feedback to grow as an artist.
2. Demonstrate technical skills and processes to achieve desired results.
3. Utilize current and available technology as a primary medium to create original works of art.

<https://www.cde.state.co.us/apps/standards/9,9,36>

1. Investigate how artists, designers and scholars narrate their social context.
2. Identify where the visual arts and artistic thinking are present in the real world.
3. Communicate messages about societal problems through the creative process.

Eighth Grade

<https://www.cde.state.co.us/apps/standards/9,10,33>

1. Interpret works of art using the language of visual art and design and conceptual art frameworks.
2. Synthesize and evaluate how time, culture and artistic style relates to contemporary art concerns.
3. Apply key concepts, issues and themes of the visual arts to solve problems using real-world applications.

<https://www.cde.state.co.us/apps/standards/9,10,34>

1. Utilize visual literacy skills to establish personal meaning and interpret the artistic intent of others.

2. Analyze, interpret and make informed judgments about works of art using different points of view.

<https://www.cde.state.co.us/apps/standards/9,10,35>

1. Employ feedback, planning and ideation processes to develop artistic voice.

2. Demonstrate technical proficiency and craftsmanship in the creative process.

3. Utilize current and available technology to refine an idea and create original and imaginative works of art.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

http://wpafbstem.com/media/wow/diy_probability_penny.pdf

Sixth Grade

<https://www.cde.state.co.us/apps/standards/4,8,8>

6.RP.A. Ratios & Proportional Relationships: Understand ratio concepts and use ratio reasoning to solve problems.

6.NS.A. The Number System: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

6.NS.B. The Number System: Compute fluently with multi-digit numbers and find common factors and multiples.

6.NS.C. The Number System: Apply and extend previous understandings of numbers to the system of rational numbers.

<https://www.cde.state.co.us/apps/standards/4,8,9>

6.EE.A. Expressions & Equations: Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.B. Expressions & Equations: Reason about and solve one-variable equations and inequalities.

6.EE.C. Expressions & Equations: Represent and analyze quantitative relationships between dependent and independent variables.

<https://www.cde.state.co.us/apps/standards/4,8,10>

6.SP.A. Statistics & Probability: Develop understanding of statistical variability.

6.SP.B. Statistics & Probability: Summarize and describe distributions.

<https://www.cde.state.co.us/apps/standards/4,8,11>

6.G.A. Geometry: Solve real-world and mathematical problems involving area, surface area, and volume.

RESOURCES:

Seventh Grade

<https://www.cde.state.co.us/apps/standards/4,9,8>

7.RP.A. Ratios & Proportional Relationships: Analyze proportional relationships and use them to solve real-world and mathematical problems.

7.NS.A. The Number System: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

<https://www.cde.state.co.us/apps/standards/4,9,9>

7.EE.A. Expressions & Equations: Use properties of operations to generate equivalent expressions.

7.EE.B. Expressions & Equations: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

<https://www.cde.state.co.us/apps/standards/4,9,10>

7.SP.A. Statistics & Probability: Use random sampling to draw inferences about a population.

7.SP.B. Statistics & Probability: Draw informal comparative inferences about two populations.

7.SP.C. Statistics & Probability: Investigate chance processes and develop, use, and evaluate probability models.

<https://www.cde.state.co.us/apps/standards/4,9,11>

7.G.A. Geometry: Draw, construct, and describe geometrical figures and describe the relationships between them.

7.G.B. Geometry: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

RESOURCES:

Eighth Grade

<https://www.cde.state.co.us/apps/standards/4,10,8>

8.NS.A. The Number System: Know that there are numbers that are not rational, and approximate them by rational numbers.

<https://www.cde.state.co.us/apps/standards/4,10,9>

8.EE.A. Expressions & Equations: Work with radicals and integer exponents.

8.EE.B. Expressions & Equations: Understand the connections between proportional relationships, lines, and linear equations.

8.EE.C. Expressions & Equations: Analyze and solve linear equations and pairs of simultaneous linear equations.

8.F.A. Functions: Define, evaluate, and compare functions.

8.F.B. Functions: Use functions to model relationships between quantities.

<https://www.cde.state.co.us/apps/standards/4,10,10>

8.SP.A. Statistics & Probability: Investigate patterns of association in bivariate data.

<https://www.cde.state.co.us/apps/standards/4,10,11>

8.G.A. Geometry: Understand congruence and similarity using physical models, transparencies, or geometry software.

8.G.B. Geometry: Understand and apply the Pythagorean Theorem.

8.G.C. Geometry: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

RESOURCES:

High School

SCIENCE Standards (CDE 2020)
High School

Physical Science

<https://www.cde.state.co.us/apps/standards/7,15,15>

1. The sub-atomic structural model and interactions between electric charges at the atomic scale can be used to explain the structure and interactions of matter.

RESOURCES:

<https://phet.colorado.edu/en/simulation/atomic-interactions>

2. Chemical processes, their rates, their outcomes, and whether or not energy is stored or released can be understood in terms of collisions of molecules, rearrangement of atoms, and changes in energy as determined by properties of elements involved.

RESOURCES:

<https://www.youtube.com/channel/UCJaMuBBLicPBIBtWYaBwuhg>

3. The strong nuclear interaction provides the primary force that holds nuclei together. Nuclear processes including fusion, fission, and radioactive decays of unstable nuclei involve changes in nuclear binding energies.

4. Newton's second law and the conservation of momentum can be used to predict changes in the motion of macroscopic objects.

RESOURCES:

http://wpafbstem.com/media/wow/diy_hovercraft.pdf

5. Forces at a distance are explained by fields that can transfer energy and can be described in terms of the arrangement and properties of the interacting objects and the distance between them.

RESOURCES:

<https://www.khanacademy.org/science/physics>

6. Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system.

RESOURCES:

<https://www.khanacademy.org/science/physics#work-and-energy>

7. Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems.

RESOURCES:

http://wpafbstem.com/media/wow/diy_catapult_chaos.pdf

<https://phet.colorado.edu/en/simulations/filter?subjects=work-energy-and-power&levels=high-school&sort=alpha&view=grid>

8. Force fields (gravitational, electric, and magnetic) contain energy and can transmit energy across space from one object to another.

RESOURCES:

http://wpafbstem.com/media/wow/diy_simple_magnetic_motor.pdf

9. Although energy cannot be destroyed, it can be converted to less useful forms as it is captured, stored and transferred.

RESOURCES:

<https://phet.colorado.edu/en/simulation/energy-forms-and-changes>

10. Waves have characteristic properties and behaviors.

RESOURCES:

<https://phet.colorado.edu/en/simulations/filter?subjects=sound-and-waves&levels=high-school&sort=alpha&view=grid>

http://wpafbstem.com/media/wow/diy_simple_spectrometer.pdf

11. Both an electromagnetic wave model and a photon model explain features of electromagnetic radiation broadly and describe common applications of electromagnetic radiation.

RESOURCES:

<https://phet.colorado.edu/en/simulations/filter?subjects=light-and-radiation&levels=high-school&sort=alpha&view=grid>

12. Multiple technologies that are part of everyday experiences are based on waves and their interactions with matter.

Life Science

<https://www.cde.state.co.us/apps/standards/7,15,16>

1. DNA codes for the complex hierarchical organization of systems that enable life's functions.

RESOURCES:

<https://learn.genetics.utah.edu/content/basics/>

<https://learn.genetics.utah.edu/content/basics/proteintypes/>

2. Growth and division of cells in complex organisms occurs by mitosis, which differentiates specific cell types.

RESOURCES:

<https://learn.genetics.utah.edu/content/basics/diagnose/>

3. Organisms use matter and energy to live and grow.

RESOURCES:

<https://learn.genetics.utah.edu/content/metabolism/>

4. Organisms interact with the living and nonliving components of the environment to obtain matter and energy.

RESOURCES:

<https://docs.google.com/document/d/1HjJyvFp73VTXdDIUuonb40SGLUQYGIEjZxyCsZS0iw/e/dit>

<https://www.khanacademy.org/science/high-school-biology/#hs-ecology>

5. Matter and energy necessary for life are conserved as they move through ecosystems.

RESOURCES:

<https://www.khanacademy.org/science/high-school-biology/hs-ecology/trophic-levels/v/flow-of-energy-and-matter-through-ecosystems>

6. A complex set of interactions determine how ecosystems respond to disturbances.

RESOURCES:

<https://www.khanacademy.org/science/high-school-biology/hs-ecology/hs-population-ecology/a/population-size-density-and-dispersal>

7. Organisms interact in groups to benefit the species.

RESOURCES:

<https://www.khanacademy.org/science/high-school-biology/hs-ecology/hs-community-ecology/v/ecosystem-biodiversity>

8. The characteristics of one generation are dependent upon the genetic information inherited from previous generations.

RESOURCES:

<http://geniverse.concord.org/geniversity/planning-resources/lesson-plans.html>
<https://learn.genetics.utah.edu/content/pigeons/>

9. Variation between individuals results from genetic and environmental factors.

RESOURCES:

<https://learn.genetics.utah.edu/content/pigeons/>

10. Evidence of common ancestry and diversity between species can be determined by examining variations including genetic, anatomical and physiological differences.

RESOURCES:

<https://learn.genetics.utah.edu/content/evolution/>
<https://learn.genetics.utah.edu/content/evolution/related/>

11. Genetic variation among organisms affects survival and reproduction.

RESOURCES:

<https://learn.genetics.utah.edu/content/evolution/criteria>

12. The environment influences survival and reproduction of organisms over multiple generations.

RESOURCES:

<https://www.nationalgeographic.org/encyclopedia/adaptation/>
<https://learn.genetics.utah.edu/content/evolution/adaptation>

13. Humans have complex interactions with ecosystems and have the ability to influence biodiversity on the planet.

RESOURCES:

<https://www.khanacademy.org/science/high-school-biology/hs-ecology#hs-human-impact-on-ecosystems>

Earth and Space Science

<https://www.cde.state.co.us/apps/standards/7,15,17>

1. All stars, including the sun, undergo stellar evolution, and the study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements, and their distances from Earth.

2. Explanations of and predictions about the motions of orbiting objects are described by the laws of physics.

3. The rock record resulting from tectonic and other geoscience processes as well as objects from the solar system can provide evidence of Earth's early history and the relative ages of major geologic formations.

4. Earth's systems, being dynamic and interacting, cause feedback effects that can increase or decrease the original changes, and these effects occur on different time scales, from sudden (e.g., volcanic ash clouds) to intermediate (ice ages) to very long-term tectonic cycles.

5. Plate tectonics can be viewed as the surface expression of mantle convection, which is driven by heat from radioactive decay within Earth's crust and mantle.

6. The planet's dynamics are greatly influenced by water's unique chemical and physical properties.

7. The role of radiation from the sun and its interactions with the atmosphere, ocean, and land are the foundation for the global climate system. Global climate models are used to predict future changes, including changes influenced by human behavior and natural factors.

8. The biosphere and Earth's other systems have many interconnections that cause a continual co-evolution of Earth's surface and life on it.

9. Resource availability has guided the development of human society and use of natural resources has associated costs, risks, and benefits.

10. Natural hazards and other geological events have shaped the course of human history at local, regional, and global scales.

RESOURCES:

<https://www.nationalgeographic.org/activity/visible-and-invisible-pollutants/>

11. Sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources, including the development of technologies.

RESOURCES:

<https://www.nationalgeographic.org/media/fort-worth-gas-waste-and-water/>

<https://www.nationalgeographic.org/lesson/human-impacts-world-ocean/>

12. Global climate models used to predict future climate change continue to improve our understanding of the impact of human activities on the global climate system.

<https://www.nationalgeographic.org/activity/preventing-bad-air-days/>

<https://www.nationalgeographic.org/encyclopedia/air-pollution/>

TECHNOLOGY and ENGINEERING Standards NGSS= Next Generation Science Standards)

High School

<https://www.nextgenscience.org/pe/hs-ps1-6-matter-and-its-interactions>

Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.*

RESOURCES:

https://www.teachengineering.org/activities/view/uoh_crystals_lesson01_activity2

<https://www.nextgenscience.org/pe/hs-ps3-3-energy>

Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.*

RESOURCES:

https://www.teachengineering.org/lessons/view/cub_flyingtshirt_lesson01

<https://www.nextgenscience.org/pe/hs-ls2-7-ecosystems-interactions-energy-and-dynamics>

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*

<https://www.teachengineering.org/activities/view/uok-2216-wastewater-treatment-plant-model-water-quality>

<https://www.nextgenscience.org/pe/hs-ls4-6-biological-evolution-unity-and-diversity>

Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.*

RESOURCES:

<https://www.teachengineering.org/lessons/view/uok-2116-plastisphere-microplastics-pollution-waste-water-treatment>

<https://www.nextgenscience.org/pe/hs-ess3-2-earth-and-human-activity>

Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.*

RESOURCES:

<https://www.teachengineering.org/activities/view/ncs-2031-cookie-mining-cost-benefit-analysis-analysis-profit>

<https://www.nextgenscience.org/pe/hs-ess3-4-earth-and-human-activity>

Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*

RESOURCES:

https://www.teachengineering.org/activities/view/van_biomimicry_activity1

<https://www.nextgenscience.org/pe/hs-ets1-1-engineering-design>

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

RESOURCES:

https://www.teachengineering.org/lessons/view/uoh_pirates_lesson01

<https://www.nextgenscience.org/pe/hs-ets1-2-engineering-design>

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

RESOURCES:

https://www.teachengineering.org/lessons/view/van_nanoparticles_lesson03

<https://www.nextgenscience.org/pe/hs-ets1-3-engineering-design>

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

RESOURCES:

https://www.teachengineering.org/lessons/view/uoh_fracture_lesson01

<https://www.nextgenscience.org/pe/hs-ets1-4-engineering-design>

Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

RESOURCES:

https://www.teachengineering.org/activities/view/nyu_fibonacci_activity1

Music

<https://www.nps.gov/flfo/learn/kidsyouth/junior-ranger-radio.htm>

ARTS Standards (Visual Arts Standards from CDE 2020)

High School

<https://www.cde.state.co.us/apps/standards/9,15,33>

1. Utilize the inquiry method of observation and the language of visual art and design to gather information and determine meaning.

2. Interpret, analyze and explain the influence of multiple contexts found in visual art and design.

3. Use artmaking processes as forms of inquiry to increase independent reasoning and perception skills to increase knowledge.

<https://www.cde.state.co.us/apps/standards/9,15,34>

1. Use criteria and personal discernment to evaluate works of art and design, taking into consideration the variables that influence how the work is perceived.

2. Articulate a personal philosophy of art, understanding various philosophies that have come before.

3. Examine the nature of diverse aesthetic experiences to build a language of representation that can be used to respond to the world.

<https://www.cde.state.co.us/apps/standards/9,15,35>

1. Establish a practice of planning and experimentation to advance concepts and technical skills.

2. Ideate and build works of art and design to demonstrate growth and proficiency in traditional and new art media.

3. Articulate and demonstrate that the making and study of art and design can be approached from a variety of perspectives.

<https://www.cde.state.co.us/apps/standards/9,15,36>

1. Research and analyze the ways visual artists, designers and scholars express personal views and beliefs and how these perspectives have a social context that enlarges the meaning of an artwork beyond the individual maker.

2. Develop proficiency in visual communication skills that extends learning to new contexts.

3. Utilize the practice of artmaking, and research historical and cultural contexts, to discern between different viewpoints, critique social problems and effect social change.

MATHEMATICS Standards (CDE 2020)

http://wpafbstem.com/media/wow/diy_random_roll.pdf

http://wpafbstem.com/media/wow/diy_contact_angle_curve.pdf

http://wpafbstem.com/media/wow/diy_time_in_the_sun.pdf

http://wpafbstem.com/media/wow/diy_probability_penny.pdf

High School

<https://www.cde.state.co.us/apps/standards/4,15,8>

HS.N-RN.A. The Real Number System: Extend the properties of exponents to rational exponents.

HS.N-RN.B. The Real Number System: Use properties of rational and irrational numbers.

HS.N-Q.A. Quantities: Reason quantitatively and use units to solve problems.

HS.N-CN.A. The Complex Number System: Perform arithmetic operations with complex numbers.

HS.N-CN.B. The Complex Number System: Represent complex numbers and their operations on the complex plane.

HS.N-CN.C. The Complex Number System: Use complex numbers in polynomial identities and equations.

HS.N-VM.A. Vector & Matrix Quantities: Represent and model with vector quantities.

HS.N-VM.B. Vector & Matrix Quantities: Perform operations on vectors.

HS.N-VM.C. Vector & Matrix Quantities: Perform operations on matrices and use matrices in applications.

<https://www.cde.state.co.us/apps/standards/4,15,9>

HS.A-SSE.A. Seeing Structure in Expressions: Interpret the structure of expressions.

HS.A-SSE.B. Seeing Structure in Expressions: Write expressions in equivalent forms to solve problems.

HS.A-APR.A. Arithmetic with Polynomials & Rational Expressions: Perform arithmetic operations on polynomials.

HS.A-APR.B. Arithmetic with Polynomials & Rational Expressions: Understand the relationship between zeros and factors of polynomials.

HS.A-APR.C. Arithmetic with Polynomials & Rational Expressions: Use polynomial identities to solve problems.

HS.A-APR.D. Arithmetic with Polynomials & Rational Expressions: Rewrite rational expressions.

HS.A-CED.A. Creating Equations: Create equations that describe numbers or relationships. ★

HS.A-REI.A. Reasoning with Equations & Inequalities: Understand solving equations as a process of reasoning and explain the reasoning.

HS.A-REI.B. Reasoning with Equations & Inequalities: Solve equations and inequalities in one variable.

HS.A-REI.C. Reasoning with Equations & Inequalities: Solve systems of equations.

HS.A-REI.D. Reasoning with Equations & Inequalities: Represent and solve equations and inequalities graphically.

HS.F-IF.A. Interpreting Functions: Understand the concept of a function and use function notation.

HS.F-IF.B. Interpreting Functions: Interpret functions that arise in applications in terms of the context.

HS.F-IF.C. Interpreting Functions: Analyze functions using different representations.

HS.F-BF.A. Building Functions: Build a function that models a relationship between two quantities.

HS.F-BF.B. Building Functions: Build new functions from existing functions.

HS.F-LE.A. Linear, Quadratic & Exponential Models: Construct and compare linear, quadratic, and exponential models and solve problems. ★

HS.F-LE.B. Linear, Quadratic, & Exponential Models: Interpret expressions for functions in terms of the situation they model. ★

HS.F-TF.A. Trigonometric Functions: Extend the domain of trigonometric functions using the unit circle.

HS.F-TF.B. Trigonometric Functions: Model periodic phenomena with trigonometric functions.

HS.F-TF.C. Trigonometric Functions: Prove and apply trigonometric identities.

<https://www.cde.state.co.us/apps/standards/4,15,10>

HS.S-ID.A. Interpreting Categorical & Quantitative Data: Summarize, represent, and interpret data on a single count or measurement variable.

HS.S-ID.B. Interpreting Categorical & Quantitative Data: Summarize, represent, and interpret data on two categorical and quantitative variables.

HS.S-ID.C. Interpreting Categorical & Quantitative Data: Interpret linear models.

HS.S-IC.A. Making Inferences & Justifying Conclusions: Understand and evaluate random processes underlying statistical experiments.

HS.S-IC.B. Making Inferences & Justifying Conclusions: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

HS.S-CP.A. Conditional Probability & the Rules of Probability: Understand independence and conditional probability and use them to interpret data.

HS.S-CP.B. Conditional Probability & the Rules of Probability: Use the rules of probability to compute probabilities of compound events in a uniform probability model.

HS.S-MD.A. Using Probability to Make Decisions: Calculate expected values and use them to solve problems.

HS.S-MD.B. Using Probability to Make Decisions: Use probability to evaluate outcomes of decisions.

<https://www.cde.state.co.us/apps/standards/4,15,11>

HS.G-CO.A. Congruence: Experiment with transformations in the plane.

HS.G-CO.B. Congruence: Understand congruence in terms of rigid motions.

HS.G-CO.C. Congruence: Prove geometric theorems.

HS.G-CO.D. Congruence: Make geometric constructions.

HS.G-SRT.A. Similarity, Right Triangles, and Trigonometry: Understand similarity in terms of similarity transformations.

HS.G-SRT.B. Similarity, Right Triangles, and Trigonometry: Prove theorems involving similarity.

HS.G-SRT.C. Similarity, Right Triangles, and Trigonometry: Define trigonometric ratios and solve problems involving right triangles.

HS.G-SRT.D. Similarity, Right Triangles, and Trigonometry: Apply trigonometry to general triangles.

HS.G-C.A. Circles: Understand and apply theorems about circles.

HS.G-C.B. Circles: Find arc lengths and areas of sectors of circles.

HS.G-GPE.A. Expressing Geometric Properties with Equations: Translate between the geometric description and the equation for a conic section.

HS.G-GPE.B. Expressing Geometric Properties with Equations: Use coordinates to prove simple geometric theorems algebraically.

HS.G-GMD.A. Geometric Measurement and Dimension: Explain volume formulas and use them to solve problems.

HS.G-GMD.B. Geometric Measurement and Dimension: Visualize relationships between two-dimensional and three-dimensional objects.

HS.G-MG.A. Modeling with Geometry: Apply geometric concepts in modeling situations.