Momentous Momentum! Week:

Rockin’ Roller Coasters - Spins, loops and drops! Roller coasters take us on crazy rides with high speeds and big adrenaline rushes! What causes them to travel so fast and who is in charge of designing them? Create your own roller coaster to discover the different types of energy they use and what is involved in getting people from start to finish safely.

Bungee Jump Physics - Ever wanted to take the plunge and bungee jump off a bridge, building or platform in mid air? Does the thought of jumping make you nervous? Test the bungee cord elasticity and see if you can keep the egg from cracking.

Crazy Catapults - Levers, levers, everywhere! Look around and count how many you can see. Are there more than you thought? All you need are two tongue depressors, rubber band, and pencil to design a lever to launch your gummy bear across the room.

Baking Soda Volcano - Have a blast exploring volcanic eruptions! Create your own volcano and watch the lava flow. Try this experiment several times and change variables to see if you can get different results.

Creative Innovation! Week:

Fossil Detective - Fossils, molds, grids and dirt! Gather your shovels and brushes to find the hidden treasures in the soil layers. Excavate and examine the sedimentary rock to discover the fossils and environments in the prehistoric layers.

Game in a Bag – Think outside the bag! In this activity kids will use their creativity to design their very own game. The name and design are all up to them, but they need to keep in mind the key game components. Kids can even create a fun plot line to add to the characters.

Flash Light Constellations – Welcome Winter Solstice! Grab a flashlight and tissue paper to design a cool constellation to light up your room during the longest night of the year. Share your unique designs on Instagram: #iheartgirlstart

Last Tower Standing - Can you build the next Leaning Tower of Pisa or Eiffel Tower? Construct a tower that can hold weight and withstand winds using only paper and tape. Discover which shapes and structures are the strongest and see if you can make the last tower standing!
DeSTEMber Activities Materials List:

What you’ll need for “Momentous Momentum” Week:

Rockin’ Roller Coaster

- Cup to catch marble
- Household objects with different heights
- Marble
- Paper Towel Rolls
- Tape (Blue painters tape or duct tape works best)
- Toilet Paper Rolls

Bungee Jumping Physics

- 6 eggs (just in case), hopefully you only need 1
- 30 pennies
- Duct tape
- Loose sheets of newspaper (in case you do the activity inside this will protect the floor)
- Pair of pantyhose
- Ruler

Crazy Catapults

- 1 wooden pencil
- 2 heavy duty rubber bands
- 2 tongue depressors
- 10 gummy bears
- 3” strip of duct tape
- Flat surface
- Paper to record results
- Tape measure or ruler

Baking Soda Volcano

- 1 piece of copy paper
- Baking soda
- Crayons or markers
- Dish soap
- Flat tray or pan
- Red and yellow food coloring
- Scissors
- Spoon
- Tape
- Vinegar
- Vitamin jar or container of similar size
DeSTEMber Activities Materials List:

What you’ll need for “Creative Innovation” Week:

Fossil Detectives

Materials for sedimentary fossil layer model
- 4 different colors of clay
- 3 small objects to represent fossils (shells, toy dinosaurs, small plastic plant leaves, etc)
- Paper or plastic cup
- Small amount of sand or dirt

Materials for excavating fossil model
- 2 paper plates
- Excavation tools – Toothpicks, craft sticks, cotton swabs, etc
- Small paint brush or toothbrush

Game in a Bag

2-6 pieces of candy
4 Rubber bands
Dice
Dixie cup
Pencil
Plastic jewels
Post-it notes
Poster Board
Markers

Flash Light Constellation

Flashlight
Pencil
Scissors
Tape or Rubber Band
Tissue Paper
Toilet Paper Roll

Last Tower Standing

4” x 6” index card
Blow dryer
Copy paper
Scissors
Scotch tape
Straws
Weights for testing – (work out weights, fishing weights, books, etc.)
Fossil Detective

Fossils, molds, grids and dirt! Gather your shovels and brushes to find the hidden treasures in the soil layers. Excavate and examine the sedimentary rock to discover the fossils and environments in the prehistoric layers.

TEKS:
5.7A Explore the processes that led to the formation of sedimentary rocks and fossil fuels
5.7D Identify fossils as evidence of past living organisms and the nature of the environments at the time using models.
4.2 & 5.2 The student uses scientific methods during laboratory and outdoor investigations.
4.3 & 5.3 The student uses critical thinking and scientific problem solving to make informed decisions.

Materials for sedimentary fossil layer model:
- 4 different colors of clay
- 3 small objects to represent fossils (shells, toy dinosaurs, small plastic plant leaves, etc)
- Paper or plastic cup
- Small amount of sand or dirt

Materials for excavating fossil model:
- 2 paper plates
- Excavation tools – Toothpicks, craft sticks, cotton swabs, etc
- Small paint brush or tooth brush

How To
Prepare sedimentary fossil layer model using the following steps:
1. You will create 3 sedimentary layers. Each will contain a model of a fossil.
2. Form each color of clay into a round flat layer.
3. Place one piece of clay into the bottom of the paper/plastic cup.
4. Using one small object, press it into the layer of clay.
5. Add another layer of clay to the cup and press another object into it.
6. Repeat step 5 with another layer of clay and your last object.
7. *Optional: You may add more layers of clay and fossil objects if you like.
8. Finally, press the fourth layer of clay (no fossil imprint) on top of the others.
9. Sprinkle some sand/dirt on top to create an earthy surface.
Fossil Detective

How To Continued...

Excavating your fossils:

1. Peel the paper/plastic cup away from the fossil model and set onto one paper plate.
2. Using excavation tools, peel and brush away layers to uncover fossils.

** Remember, paleontologists have to be SUPER careful because fossils are very old and fragile! They also don’t touch them with their bare hands to protect them from any oil in our skin that might damage them.
3. Use your paint brush to dust away any dirt and clay from the fossils. Lay each fossil out onto the second paper plate and talk about what you can learn from it. Is your fossil from a plant or animal? What type of climate might it have lived in?

Why Does it Work?

Fossils are formed when once-living organisms are pressed between layers of sediment as sedimentary rock forms. When the sediments harden into rock over long periods of time (thousands to millions of years), evidence of the organisms remain in the rock. There are four common types of fossils:

1. **Trace fossils**: These fossils include footprints, tracks, eggs, and burrows made by organisms and preserved in rock.
2. **Molds**: Molds formed when an organism died and became buried in sediment or mud. The organism eventually decayed or dissolved away leaving a cavity or shape of the organism in the rock.
3. **Cast**: A cast formed when a mold was filled in with minerals or grains of rock, and then turned into solid rock.
4. **Petrified fossil**: A petrified fossil formed when the hard parts of an organism were replaced by minerals. The fossil looks like a bone or tree trunk but it is really made of rock.

Like paleontologists, we can carefully dig through the sedimentary rock layers using tools so that we do not damage the fossils inside. We can learn about the organism’s environment and, possibly, even predict when they lived based on the age and number of layers in the sedimentary rock.
Fossil Detective

Career Connection:

A **Paleontologist** studies fossils and uses fossils to try to reconstruct the history of the Earth and the life on it. Paleontologists can provide historical data on past climates and apply it towards understanding future trends and their likely effects. Some paleontologists teach at colleges and some work in museums, while others work for the government or for oil companies needing help finding sources of petroleum.

Resources:  
http://www.oum.ox.ac.uk/thezone/fossils/intro/form.htm  
http://idahoptv.org/dialogue4kids/season6/fossils/facts.cfm  
http://petrifiedwoodmuseum.org/FossilTypes.htm
Fossil Detective Reading Companions

“Fossil” by Bill Thomson (Ages 5-8) 40 Pages

When a boy and his dog go for a hike, the boy trips on a fossil, and it comes to life, revealing an ancient plant. The boy is so intrigued that he breaks two more fossils that come to life—a dragonfly and a pteranodon. When these prehistoric creatures collide with present reality, the boy must figure out a way to make things go back to normal. Visually told through art, this "wordless story" will surely spark imagination and creativity.

“Fossils Tell of Long Ago” by Aliki Aliki (Ages 4-8) 32 Pages

What is a fossil? Sometimes it's the imprint of an ancient leaf in a rock. Or it could be the skeleton of a dinosaur that has turned to stone! With clear prose and lovely, full-color illustrations, award-winning author and illustrator Aliki describes the different ways fossils are formed and what they tell us about life on Earth long ago. This book also includes an activity guide so kids can create their own fossils for someone to find a million years from now.

“Dinosaur Hunters (Step into Reading Book)” by Kate McMullan (Ages 7-9) 48 Pages

Less than 200 years ago, nobody knew that dinosaurs had ever existed. Now, scientists who study fossils know about many kinds of dinosaurs and where they lived. The hunt is on for new information about our favorite prehistoric reptiles!

“Digging Up Dinosaurs” by Aliki Aliki (Ages 4-8) 32 Pages

How did those enormous dinosaur skeletons get inside the museum? Long ago, dinosaurs ruled the Earth. Then, suddenly, they died out. For thousands of years, no one knew these giant creatures had ever existed. Then people began finding fossils—bones and teeth and footprints that had turned to stone. Today, teams of experts work together to dig dinosaur fossils out of the ground, bone by fragile bone. Then they put the skeletons together again inside museums, to look just like the dinosaurs of millions of years ago.
Think outside the bag! In this activity kids will use their creativity to design their very own game. The name and design are all up to them, but they need to keep in mind the key game components. Kids can even create a fun plot line to add to the characters.

How To
Discuss the components that make up a game. Review the definitions of each game component.

- **Rules** – you need rules so that the game isn’t too crazy and chaotic
- **Goal/purpose** – there will be something that you are working towards in the game
- **Challenge** – there are obstacles, enemies, etc. that make it more difficult to accomplish your goal, this makes the game fun and exciting! Remember, you don’t want the game to be impossible because then it becomes boring if you can never reach your goal.
- **Characters/Agents** – the different people, animals, things, etc. in the game
- **Setting** – the virtual world where the game takes place, this can be simple or complex
- **Fictitious** – a game is not real, so it can be as fantastical as you want to make it

**Materials:**
- 2-6 pieces of candy
- 4 Rubber bands
- Dice
- Dixie cup
- Pencil
- Plastic jewels
- Post-it notes
- Poster board
- Markers
Game in a Bag

How To Continued...

In each bag you will find various materials, your job is to create a game with these materials.

You will need to:

• Name your game
• Create a goal/purpose for your game
• What is the challenge?
• What is the setting?
• What are the characters and what are their rules?
• List the rules in the game
• Be sure that you create attributes and parameters for your characters.

Why Does it Work?

When the kids are finished designing their game, have them explain the rules and start to play! Decide if the challenge or goal is too difficult or easy. From that you can adjust and revise your game to make it even better. Take turns playing all the kids games.

Career Connection:

Game Designers and Game Developers use computer programming knowledge to program the components of a game. They may use their own digital art or employ digital designers to create the setting and characters of a game. They often work in teams and work through a ‘design process’ that involves storyboards, drafting, problem solving, and redesigning to improve their work.
Game in a Bag Reading Companions

“The Book with no Pictures” by B.J. Novak (Ages 5-8) 48 Pages

A picture book without any pictures?!?!! Would we expect anything less from B.J. Novak, that actor/writer/producer (The Office), bestselling author (One More Thing) and standup comic? This non-picture picture book demands to be read aloud; in fact, even its demand demands to be read out loud. Kids will delight in its silly stories, nonsensical sounds and mirth-inducing songs. Picture this: No pictures.

“The Day the Crayons Quit” by Drew Daywalt (Ages 3-7) 40 Pages

Clearly, Duncan's crayons had had enough. When he opened his art box that day, he found not a single crayon, only letters from disgruntled color sticks. Their complaints were various: Some felt overused or misused; others, neglected. Blue, for example, wondered how many oceans he would be obliged to color and Beige despaired that all the good jobs were going to Brown. For poor Duncan, this spontaneous strike called for quick action. Almost instantly, the aspiring artist becomes a mediator.

“The Best Story” by Eileen Spinelli (Ages 6-8) 32 Pages

The best story is one that comes from the heart. The library is having a contest for the best story, and the quirky narrator of this story just has to win that rollercoaster ride with her favorite author! But what makes a story the best? Her brother Tim says the best stories have lots of action. Her father thinks the best stories are the funniest. And Aunt Jane tells her the best stories have to make people cry. A story that does all these things doesn't seem quite right, though, and the one thing the whole family can agree on is that the best story has to be your own.
Flashlight Constellation

Welcome Winter Solstice! Grab a flashlight and tissue paper to design a cool constellation to light up your room during the longest night of the year. Share your unique designs on Instagram: #iheartgirlstart

Fun Fact: National Flashlight Day is December 21st
December 21 is Winter Solstice which is the shortest day, and longest night, of the year. It is believed that National Flashlight Day came about because of all the dark night visits with family during the holidays.

How To

1. Cut a 4”x4” square out of the tissue paper
2. Place the tissue paper over one opening of the toilet paper roll and secure using tape or a rubber band.
3. Using the tip of the pencil, gently poke holes into the tissue paper to form a constellation (picture).
4. Now you are ready to display your constellation! Shine the flashlight through the open end of the toilet paper roll so the stars are displaying onto a blank wall.
5. Create a story to go with your constellation!

Where Do Stars Come From?

A star begins as a giant cloud of gas and dust, called a nebula. Gravity pulls the gas close together to form a gas clump that heats up and becomes a protostar. The protostar continues to heat up until about 15,000,000°C (27,000,032°F!), causing the gas to clump closer together and form a main sequence star—the star we see.
Where Do Stars Come From Continued...

These stars shine for millions, even billions of years! Then the star cools down, causing the inside to contract, and the outside to expand. The star is now red, and is called a red giant. Eventually, the red giant collapses, causing the star to reach over 100,000,000,000 °C (over 180,000,000,000°F!), resulting in a supernova explosion.

Career Connection:

Stellar physicists research the formation, evolution, interior and the atmospheres of stars.

Resources:

www.nasa.gov
www.enchantedlearning.com
www.astronomynotes.com
Flash Light Constellations Reading Companions

“Bright Star, Night Star: An Astronomy Story” by Karl Beckstrand (Ages 5-9) 30 Pages

A picture book about the night sky—Bright Star, Night Star activities include finding constellations, planets, the moon, sun, and other heavenly bodies. It has rich illustrations for vocabulary comprehension (ages 4 - 9) and characters of color. Expose your child to the starry skies, Monument Valley, and a little space science.

“Starry Sky (DK Readers Level 2)” by Kate Hayden (Ages 6-8) 32 Pages

DK Readers books combine stunning photos and lively illustrations with engaging, age-appropriate stories. It's a multilevel reading program guaranteed to capture children's interest while developing reading skills and general knowledge. Starry Sky takes a closer look at the night sky. Kids can discover the secrets of the stars!

“Flashlight” by Betsy James (Ages 4-8) 32 Pages

When Marie becomes frightened spending the night trying to sleep in her grandparents' living room, her understanding Grandpa brings her a flashlight to chase away the scary darkness. She finds many creative ways to explore a once threatening environment, in this simple, but satisfying picture book. Imaginative paintings emphasize the contrast between light and darkness, while at the same time, show a reassuringly cozy couch made into a bed, that she shares with her younger sister.

“Flashlight” by Lizi Boyd (Ages 4-6) 40 Pages

Inside a tent it's cozy. But what is going on outside? Is it dark? Is it scary? Not if you have your trusty flashlight! Told solely through images and using a spare yet dramatic palette, artist Lizi Boyd has crafted a masterful exploration of night, nature, and art. Both lyrical and humorous, this visual poem—like the flashlight beam itself—reveals that there is magic in the darkness. We just have to look for it.
Last Tower Standing

Can you build the next Leaning Tower of Pisa or Eiffel Tower? Construct a tower that can hold weight and withstand winds using only paper and tape. Discover which shapes and structures are the strongest and see if you can make the last tower standing!

TEKS:
6.8B Identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces.

How To

1. Place a piece of paper on a flat surface. Place a straw in the corner of your paper and use it to roll your paper into a thin tube.
2. Tape your tube so that it doesn’t come unraveled. Notice that your tube is strongest in the middle where there are more layers of paper.
3. Trim the ends of your tube so that it is 8 inches long.
4. Continue these steps to make 4 more tubes.
5. Tape four of these tubes together at their ends to make a square. Observe that this square on its own wouldn’t carry very much weight.
7. We now know that structures are stronger when they are made of triangles. Tape one more tube diagonally in your square, making it into two triangles.
8. Repeat steps 1-7 to make 6 squares, then tape them together to make one cube.
9. Using your knowledge of structures, continue to build onto your tower to make it as strong as it can be.

Materials:
- 4” x 6” index card
- Blow dryer
- Copy paper
- Scissors
- Scotch tape
- Straws
- Weights for testing – (work out weights, fishing weights, books, etc.)
Why Does it Work?

Towers use different forces to remain standing. Triangles are the most rigid shape because they only experience one force at a time on each side. Your tower is able to hold the most weight when you use triangles in its structure.

Career Connection:

Structural Engineers are concerned with the design and construction of all types of structures such as bridges, buildings, dams, tunnels, power plants, offshore drilling platforms, and space satellites. Structural engineers research the forces that will affect the structure, and then develop a design that allows it to withstand these forces.

Resources: http://www.pbs.org/wgbh/buildingbig/index.html
Last Tower Standing Reading Companions

“Build, Dogs, Build: A Tall Tail” by James Horvath (Ages 4-8) 40 Pages

In Build, Dogs, Build, our favorite doggy construction team is pulling down an old building to make way for a new one! Using equipment like cranes, bulldozers, dump trucks, and cement mixers, these busy dogs must race to finish the job in this fun follow-up to Dig, Dogs, Dig.

“Buildings: Design and Engineering for STEM” by Alex Woolf (Ages 11-14) 56 Pages

Did you know that every building has a life cycle? That’s what we call the stages from its design, construction, and opening to its use, maintenance, and demolition and disposal at the end of its useful life. This book explains what happens during these stages, such as planning, the sourcing of materials, the construction process, and the decisions made by designers and engineers, and refurbishing and recycling.
Rockin’ Roller Coasters

Spins, loops and drops! Roller coasters take us on crazy rides with high speeds and big adrenaline rushes! What causes them to travel so fast and who is in charge of designing them? Create your own roller coaster to discover the different types of energy they use and what is involved in getting people from start to finish safely.

TEKS:
6.8A The student knows force and motion are related to potential and kinetic energy.

How To

1. *Optional* Begin by cutting your toilet paper and paper towel rolls in half across the diameter of the roll. This will create the open track for your roller coaster. You may want to leave some pieces as the whole tube if you want your coaster to have some tunnels.
2. Place the first piece of your track at a higher elevation (on a chair, bookshelf, etc). This will create a bigger drop for your roller coaster and higher speeds.
3. Connect more pieces of track by taping them end to end.
4. Use your own creativity to create turns, loops, and drops as you add each piece.
5. After designing, your rollercoaster from start to finish, tape the cup to the very last piece of track. This will catch your marble after each run.
6. Drop your marble from the beginning of the roller coaster and watch it drop, loop and turn!

Materials:
- Cup to catch marble
- Household objects with different heights
- Marble
- Paper Towel Rolls
- Tape (Blue painters tape or duct tape works best)
- Toilet Paper Rolls
Rockin’ Roller Coasters

Why Does it Work?

In physics, objects have energy if they can cause changes to occur. This energy can come in many different forms. Stored energy is called potential energy. To store energy, work must be done, such as winding up a spring, charging a battery, or, in this case, holding the marble just about the start of the rollercoaster track. An object that has potential energy may release its stored energy to be transformed in other forms of energy.

Kinetic energy is the energy of motion. Any object that has mass and is moving has kinetic energy. Once the marble is released onto the rollercoaster track and begins rolling, its potential energy is transformed into kinetic energy as it moves down the track.

Career Connection:

Roller coaster engineers combine several types of engineering to create the thrilling coasters that so many people line up to ride. They use mechanical engineering to design the famous loops and drops using calculations to understand all of the different forces that will act upon the riders, cars, and track. Then, roller coaster engineers use structural engineering to understand how to actually build the coaster, from what types of material will be used to how will the coaster be supported at such high speeds. The third piece of being a roller coaster engineer is electrical engineering. They design computer programs to model their roller coasters and calculate the safe amount of time between each run of the track.
Rockin’ Roller Coasters Reading Companions:

“The Screaming Mean Machine” by Joy Cowley (Ages 9-12) 29 Pages

With fun illustrations and rhyming text, this spirited picture book captures the excitement of a young girl’s first roller coaster ride.

“Roller Coaster” by Marla Frazee (Ages 3-5) 32 Pages

Twelve people set aside their fears and ride a roller coaster, including one who has never done so before. Zoom along with a fast-as-lightning roller coaster in this awesome picture book from author/illustrator Marla Frazee.

“The Roller Coaster Kid” by Mary Ann Rodman (Ages 4-8) 40 Pages

Zach and his grandpa love all of the same things . . . except the roller coaster. His grandpa once rode it one hundred times! But Zach doesn’t like the roller coaster. So when Grandpa goes on it every summer, Zach goes on the Big wheel with Grandma. She understands. But one summer, Grandma is gone and Grandpa is not the same. He misses her terribly. So does Zach.

“Bones and the Roller Coaster Mystery” by David A. Adler (Ages 6-8) 32 Pages

Detective Jeffrey Bones and his grandpa are at the amusement park. They buy lots of tickets for games, the merry-go-round, and the roller coaster. They have great fun playing games, but when it’s time to ride the big coaster, they discover their tickets are missing. Were they stolen? Can Bones solve the mystery and find their tickets to ride?
Bungee Jump Physics

Ever wanted to take the plunge and bungee jump off a bridge, building or platform in mid air? Does the thought of jumping make you nervous? Test the bungee cord elasticity and see if you can keep the egg from cracking.

TEKS:
6.8A Compare and contrast potential and kinetic energy.
6.8B Identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces.
6.9 Force, motion, and energy. The student knows that the Law of Conservation of Energy states that energy can neither be created nor destroyed, it just changes form.

Materials:
- 6 eggs (just in case), hopefully you only need 1
- 30 pennies
- Duct tape
- Loose sheets of newspaper (in case you do the activity inside this will protect the floor)
- Pair of pantyhose
- Ruler

How To
1. Choose an elevated spot for the bungee jump. A tree branch outdoors is ideal, but a ladder also works. You want the egg to fall to within an inch of the child’s face when he/she is lying on the ground looking up at it, but no closer.
2. Use the ruler to measure the distance from the back of his/her head to the tip of his/her nose; add an “inch for safety” to this number.
3. Before experimenting with the egg, have the child work out the weight of the egg for a test run. Ask him/her to hold the egg in one hand and add pennies to the other hand until it feels like the coins weigh the same as the egg.
4. Add the “egg’s worth” of pennies to one leg of the pantyhose and push them down to the toes. Tape the toes end of the other pantyhose leg to the branch or ladder.

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Bungee Jump Physics

How To Continued...

5. Do the test run. Hold the “egg” of pennies on the edge of the branch or ladder step and let the pantyhose full of coins fall toward the ground. Check its distance from the ground. It should stop above the ground at exactly the distance calculated in step two. If it doesn’t, adjust the height by re-taping the hose to the branch or ladder higher up or down on the leg.

6. Test again if needed to check your adjustments.

7. Now you are ready for the real thing. Remove the pennies from the pantyhose and replace them with an egg. Call in your audience, have the child settle in his/her place on the ground, and after a suspenseful countdown, do the drop. Bombs away!

Why Does it Work?

The nylon in the pantyhose has a natural elasticity and works like a bungee cord; the force of the falling egg causes it to change its form. As the cord stretches, it slows the egg until it stops falling, and the spring in the cord pulls the egg up and away from the ground. Elastic materials return to their original shape after they have been stretched, and for this activity the amount of elasticity in the pantyhose and how much the egg weighs determine how far the hose will stretch. As you measure and conduct test runs, you’ll be working out the components of Newton's famous physics equation: force = mass × acceleration.

Career Connection:

Materials Engineers are in charge of researching and designing new materials that are improving technology in every field. Memory metals are a specific example of a new elastic material engineers designed to remember their original shape and return to them if they are bent or misshapen, for example sunglass frames. Other examples of products created by materials engineers include mosquito repellent clothing, nano-sized polymers to repair broken bones, polymers used in LCD technology for smart phones and improved skin grafts for burn victims.

Resources: http://www.education.com/activity/article/egg-bungee-jump/
http://pbskids.org/zoom/printables/activities/pdfs/eggbungeejump.pdf
Bungee Jump Physics Reading Companions

“Jimmy’s Boa and the Bungee Jump Slam Dunk” by Trinka Hanks Noble (Ages 4-8) 32 Pages

There's nothing ordinary about basketball practice when Meggie and her friends are involved, especially after Miss Peachtree takes over the gym for her dance lessons. When Jimmy refuses to dance with anybody but his pet boa constrictor, mayhem becomes the name of the game! Yes, Jimmy's boa is back—this time with a waltzing poodle and a herd of bouncing rabbits. Readers have courtside seats to witness the fancy, super-funny teamwork of Meggie, her friends, and even the stuffy Miss Peachtree. And with Jimmy's boa involved, basketball will never be the same!

“Bungee Jumping (Living on the Edge)” by Shane McFee (Ages 8-12) 24 Pages

This volume briefly explores the sport of bungee jumping, and examines what goes into safely jumping and enjoying the sport.

“No Jumping on the Bed!” by Ted Arnold (Ages 3-5) 32 Pages

Walter, like most kids, can't resist jumping on his bed although his father has warned him against it. Walter lives in an apartment on the top floor, no less, so as Walter jumps higher and higher—you guessed it—Walter and his bed not only fall but go through the floor into Miss Hattie's spaghetti and meatballs, on down into Mr. Matty's aquarium, Aunt Batty's stamp collection, Patty and Natty's block creations, Mr. Hanratty's and together, they all fall into Maestro Ferlingatti’s string quartet. Just then Walter opens his eyes. Readers can find out what happens as they peruse the scene stealing illustrations complete with appearances from the original edition of the book.
Crazy Catapults

Levers, levers, everywhere! Look around and count how many you can see. Are there more than you thought? All you need are two tongue depressors, rubber band, and pencil to design a lever to launch your gummy bear across the room.

TEKS:
6.8B Identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces.

How To

1. Pass out the supplies to each group, or create the catapult on your own at home.
2. Place the tongue depressors on top of each other and wrap them together with a rubber band on one end, about an inch from the end.
3. Wrap a second rubber band around the first to ensure it is secure.
4. Slide the pencil between the two tongue depressors near the rubber band.
5. Use the strip of duct tape to tape the bottom tongue depressor to the flat surface.
6. Now you are ready for launch! Place the gummy bears one at a time at the elevated end of the top tongue depressor and use your pointer finger to pull the depressor toward the flat surface. Then let go!
7. Measure the distance each gummy bear travels using the end of the depressors with the rubber band as your start point.
8. Find the average distance all ten gummy bears traveled.
9. As an option: Give the pairs/groups the supplies and allow them to design their own catapult to test. Add a few materials to the list: 1 plastic spoon, 2 more rubber bands, and an extra strip of duct tape.

Materials:
- 1 wooden pencil
- 2 heavy duty rubber bands
- 2 tongue depressors
- 10 gummy bears
- 3” strip of duct tape
- Flat surface
- Paper to record results
- Tape measure or ruler
Crazy Catapults

Why Does it Work?
Levers make work easier by converting a small amount of effort into a lot of force (like a hammer) or by converting a little movement into a large movement (like a broom or golf club). And who doesn't want to get more done with less effort? Hundreds of years ago, soldiers hurled heavy stones using catapults, which use a lever system to send the rocks flying. Baseball players use a lever every time they are up at bat. When you swing a bat, you move the part you’re holding just a little bit. But the other end of the bat moves a lot! The same with the flippers on pinball machines—a little flick sends the ball flying. A see-saw is a big lever, though you’d need a great deal of force to send someone flying!

Career Connection:
Manufacturing Engineers create and make things. They design, direct and coordinate the processes and systems for making almost any kind of product – from beginning to end. Manufacturing engineers apply scientific principles in designing and producing quality products. This includes finding ways to improve what they make and packaging planning.

Resources: http://www.brunswick.k12.me.us/pgroves/files/2013/05/AP-Stats-Gummy-Bear-Project.pdf
Crazy Catapults Reading Companions

“Castle: How it Works” by Sheila Keenan (Ages 7-8) 32 Pages

Every part of the castle has a function. Walls keep the enemy out. Towers protect the lord and the soldiers. From the moat and portcullis to the great hall and dungeon, see how a castle works as an enemy army tries to storm the walls.

“MIGHTY! Castles: Level 3 (Spectrum Readers)” by Lisa Kurkov (Ages 6-8) 32 Pages

Medieval castles were the settings for royal feasts and epic battles. MIGHTY! Castles takes readers inside these ancient fortresses and explains how they provided protection during dangerous times. The Spectrum(R) Readers are the perfect Common Core aligned tool to support the development of nonfiction reading skills. Each leveled reader features high-interest informational content, exciting full-color photo images, and Common Core aligned comprehension practice focused on the development of critical thinking skills. Leveled to the respected Fountas and Pinnell and Lexile systems, these 32-page books are perfect for young readers who are ready to explore leisure reading on their own.

“Castles: Information for Young Readers-Level 1” by Stephanie Turnbull (Ages 5-7) 32 Pages

Who lived in a castle and what was it like? In this book you’ll find the answers and lots more about the wonderful world of castles. Castles is an exciting series of books for children who are beginning to read on their own. The easy-to-read text has been specially written with the help of a reading expert.
Have a blast exploring volcanic eruptions! Create your own volcano and watch the lava flow. Try this experiment several times and change variables to see if you can get different results.

TEKS:
3.3C Represent the natural world using models such as volcanoes or Sun, Earth, and Moon system and identify their limitations, including size, properties, and materials.
4.3C Represent the natural world using models such as rivers, stream tables, or fossils and identify their limitations, including accuracy and size.
3.7B Investigate rapid changes in Earth’s surface such as volcanic eruptions, earthquakes, and landslides
5.5D Identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water.

How To

1. Cut a strip of copy paper in half lengthwise.
2. Form an open ended cone shape that is large enough to fit over the vitamin bottle. Make sure that the smaller opening (top of the cone) is large enough to fit your metal spoon through. Tape the ends of the paper to secure the cone shape. Trim the bottom of the cone so that it is straight and can stand up upright.
3. Decorate the cone so that it looks like a volcano.
4. Place the vitamin bottle on the tray with the cone over the top of the bottle.
5. Add two spoonfuls of baking powder.
6. Add about a spoonful of dish soap.
7. Add several drops of red and yellow food coloring.
8. Now that you are ready. Pour in about an ounce of vinegar.
9. Quickly set the lid of the container over the opening. Do not fasten it on the bottle.
10. Watch what happens!

Materials:
- 1 piece of copy paper
- Baking soda
- Crayons or markers
- Dish soap
- Flat tray or pan
- Red and yellow food coloring
- Scissors
- Spoon
- Tape
- Vinegar
- Vitamin jar or container of similar size
Lava Flow

Why Does it Work?
A volcano is produced over thousands of years as heat and pressure build up. A volcano consists of an opening, or a vent, through which magma and dissolved gases are released. Just underneath the Earth's crust is a layer called the mantle, which is made of up plates that are always moving and shifting. Sometimes the plates separate. That creates heat and causes the mantle to melt into magma. The magma comes up through the crack between the plates, and forms lava at the Earth’s surface. The lava spreads out, cools down, and becomes rock again.

How is this experiment like a volcanic eruption? This volcano model erupts due a chemical reaction between the baking soda and vinegar, and not due to heat and pressure as in a real volcano. Like some volcanoes, this model releases a gas (carbon dioxide) into the air and lava flows slowly over the sides of the vent to form a river or lake of lava. By placing the lid over the medicine bottle you can see how the force of the eruption pushes the lid away from the vent, allowing the lava to flow.

Career Connection:
A volcanologist studies the remains of either dead or dormant volcanoes and monitors currently present volcanoes that may be active. Volcanologists work to understand how and why volcanoes erupt, how to predict eruptions, the impacts of eruptions on Earth’s history and how eruptions affect humans and their environment.

Resources:  http://www.sciencebob.com/experiments/volcano.php
http://www.stevespanglerscience.com/lab/experiments/erupting-peroxide-volcano

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Baking Soda Volcano Reading Companions

“My Mouth is a Volcano!” By Julia Cook (Ages 4-8) 32 Pages

Louis always interrupts! All of his thoughts are very important to him and when he has something to say, his words rumble and grumble in his tummy, they wiggle and jigggle on his tongue, and press firmly against his teeth, right before he ERUPTS (or interrupts). His mouth is a volcano! But when others begin to interrupt Louis, he learns how to respectfully wait for his turn to talk. Told from Louis' perspective, this story takes an empathetic approach to the habit of interrupting and teaches children a witty technique to help them manage their rambunctious thoughts and words.

“Volcanoes! (National Geographic Readers Series)” by Anne Schreiber (Ages 5-7) 32 Pages

The cool story of volcanoes will intrigue kids and adults alike. Hot melted rock from the middle of our planet forces its way up through cracks in the Earth’s crusts, exploding violently and sometimes unexpectedly in volcanic fury that can terrorize populations for months, even years. Anne Schreiber’s narrative gives readers a little of the science, a little of the history, and a lot of the action. National Geographic photography fires the imagination on dramatic spreads alive with vivid images of lava, ash, molten rock, weird rocks, and steaming seawater.

“Volcanoes” by William Rice (Ages 7-8) 32 Pages

Images of an erupting volcano can be mesmerizing. Readers may be surprised to learn that volcanoes erupt every day. Some erupt constantly, while others lie dormant for years or even centuries. Readers learn what happens beneath the Earth to cause a volcanic eruption and the different structures beneath the Earth that cause new land to form, all with engaging text and brilliant photos.