Super-Duper Science Power Packet

Rise and Shine

Fun learning activities for K-5th grade!

Arkansas PBS

Leadership Support Service

Rise and Shine!

¡Este paquete también está disponible en español!

myarkansaspbs.org/riseandshine/es

Welcome, friends! We're glad you are joining us for our "Rise and Shine" summer learning adventure! We have a lot of fun learning planned and some great teachers leading us along the way. This Power Packet contains lots of different lessons and activities for you to choose from. You can also watch "Rise and Shine" on TV, on our website, or by streaming it. You will see some fantastic PBS KIDS shows, mini lessons with some of Arkansas's best teachers, video field trips to interesting places all around our state, cool new songs and dance videos, and more!

In addition to these activities, you can visit myarkansaspbs.org/riseandshine for mini lessons with some of the best teachers in Arkansas along with other fun content to continue learning at home!

Power Packet Guide:

Temperature Changes (K-2)

Power Goal:

Observe how the sun changes the temperature of soil, rocks, and water.

Learning Choices:

Put your scientist coat on and make some discoveries! Today you will be exploring what happens to the Earth around you when the sun comes out!

With supervision, go outside during the morning, at noon, and at night. Find some soil, water, and rocks to touch and put a checkmark ✓ in the box that describes how each item feels. The morning observation for soil has been done for you.

A.

Scientist's Name: _____

Date: _____

Put a checkmark here

		Cool	Warm	Hot
Morning Observation	Soil	✓	☐	☐
	Water	☐	☐	☐
	Rocks	☐	☐	☐
Noon Observation	Soil	☐	☐	☐
	Water	☐	☐	☐
	Rocks	☐	☐	☐
Evening Observation	Soil	☐	☐	☐
	Water	☐	☐	☐
	Rocks	☐	☐	☐

B. What did you learn?

Answers: A. Possible answers may include all morning observations checked cool, all noon observations checked hot, and all evening observations checked warm.
B. Answers will vary but may include that more direct sunlight causes items to become warmer.

Like an Animal (K-2)

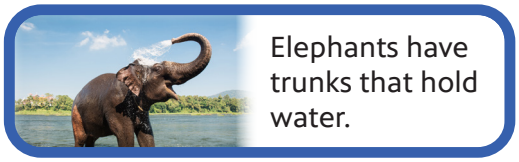
Power Goal: Solve real-world problems using mimicry of animals.

Learning Choices: Humans **mimic** (or copy) traits of animals. For example, fish have gills that help them breathe underwater. Humans copied this by creating scuba gear to help us swim underwater.

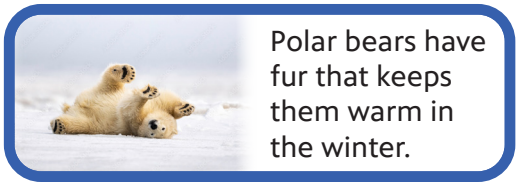
A. Draw a line connecting the animal and its trait to the mimicry that humans use. Turtle has been done for you.

Turtles have a hard shell that protects them.

Birds have wings that help them move from one place to another by flying.



Elephants have trunks that hold water.



Polar bears have fur that keeps them warm in the winter.

Fish have scales that keep them protected.

Humans wear pads when skateboarding in order to keep their knees and elbows protected.

Humans use hoses to water their plants.

Humans use coats and jackets to keep themselves warm.

Bicyclists wear helmets to protect their heads.

Planes allow humans to travel from one place to another quickly.

B. Think of other ways humans mimic animals. Draw your response below.

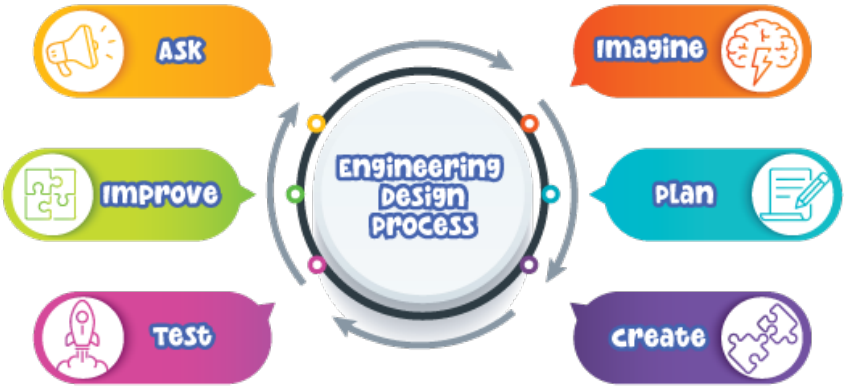
Answers: A. turtle-helmet, bird-plane, elephant-hose, polar bear-winter coat, fish-pads B. Answers will vary.

Sketch It Out (K-2)

Power Goal: Create a sketch using various objects to solve a problem.

Learning Choices: Scientists use a design process to help them solve problems.

You and your friends each find an interesting rock in the park. You decide to see who can move their rock across the park field without touching the rock with their hands. Use the document below to plan how to get your rock to move.



A.

Ask: What is the problem you are trying to solve?

How can I move a rock across a field without using my hands?

Imagine: Brainstorm how you can solve your problem.

Plan: Draw your plan.

Create: List materials you would use. Examples include wood, string, and rubber bands.

1.

2.

3.

Test: What were the results?

B. **Improve:** After you have tested your plan, think about what worked and what you would like to change. Write your answers below.

Answers: A. Answers will vary. B. Answers will vary.

Good Vibrations (K-2)

Power Goal: Investigate how vibration and sound are related.

Learning Choice: We are surrounded by sounds. Sounds are caused by vibrations or movement back and forth. The vibrations create sound waves that move through air, water, and solid objects until they reach our ears.

A. Let's explore! Follow the directions below.

1. Hold two fingers over your throat.
2. Say, "Ahhh."
3. Write or draw what you feel in the box.

B. Let's explore more vibrations and sound! Follow the directions below.

1. With supervision, fill a glass with water.
2. Tap the side of the glass.
3. What do you hear?

4. Draw what you see happening to the water.

Answers: A. Answer should include that the sound makes their throat move. B. 3-Answer should include that tapping the glass makes noise. 4-Picture should show ripples or waves in the water.

Making Shade (K-2)

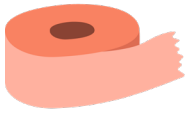
Power Goal: Use materials to design and build a structure that will provide shade.

Learning Choices: The sun provides light and warmth. Trees provide shade and block the light, making the air feel cooler.

A. Think of how a tree provides shade on a sunny day.

Using the materials below, design and draw two different structures that will keep the snow cone from melting.

Materials: Circle all the materials you will use for the first design. Star all the materials you will use for the second design.





1.

2.

B. Write or draw other materials you could use to provide shade.

Answers: A. Answers will vary but may include designs that resemble a roof or an umbrella. B. Answers will vary.

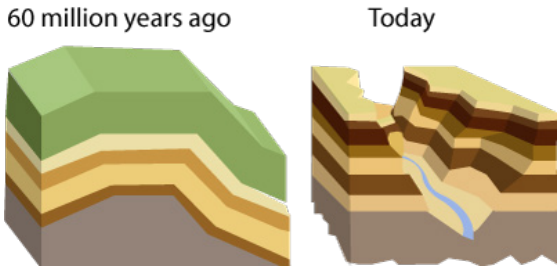
Earth Changes over Time (K-2)

Power Goal: Determine whether events on Earth occur quickly or slowly using several sources.

Learning Choice:

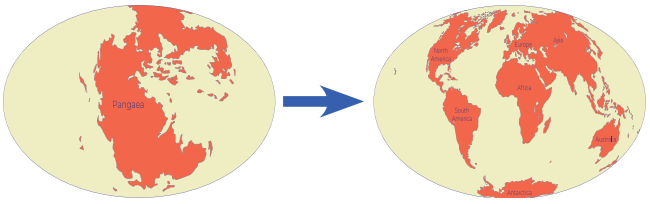
Below are four examples of events that have happened on Earth. Each event comes from a different source (newspaper, map, etc.). In the box next to each source, circle whether the event happened quickly (days/weeks) or slowly (years/decades) and explain why.

1. Grand Canyon



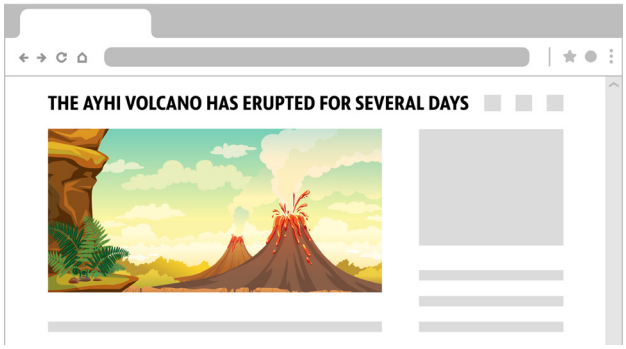
quickly/slowly
explain:

2. Pangea – Formation of continents



quickly/slowly
explain:

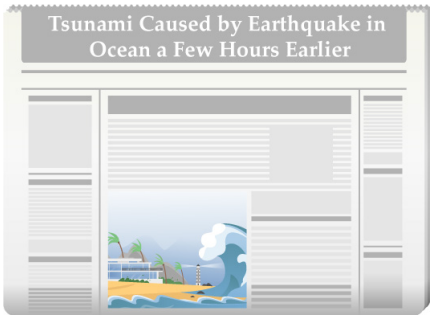
3. Ayhi Volcano, USA



quickly/slowly
explain:

4. Indian Ocean Tsunami

*A ***tsunami*** *is a series of very large and destructive waves.*



quickly/slowly
explain:

Answers: 1-These changes happened slowly. Rock formations take years to form. 2-These changes happened slowly. Continents take millions of years to change. 3-These changes happened quickly. Volcanoes happen over a period of days. 4-These changes happened quickly. Tsunamis are quick responses to sudden earthquakes.

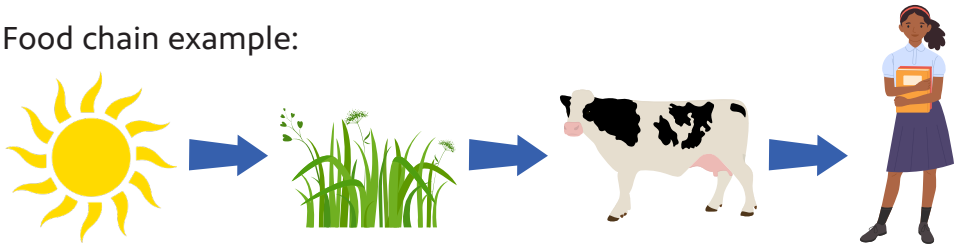
Energy Transfer and Food Chains (3-5)

Power Goal: Create models to show the transfer of energy from the sun to living things.

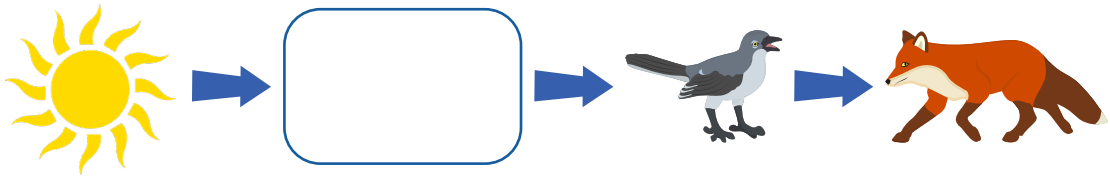
Learning Choices:

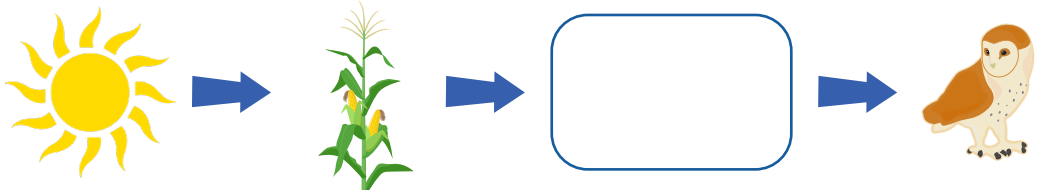
A. An **ecosystem** is made up of all living and non-living things that interact in an area. It is also important for energy transfer. **Energy transfer** is the movement of energy through a system. Food chains are one way to show energy transfer.

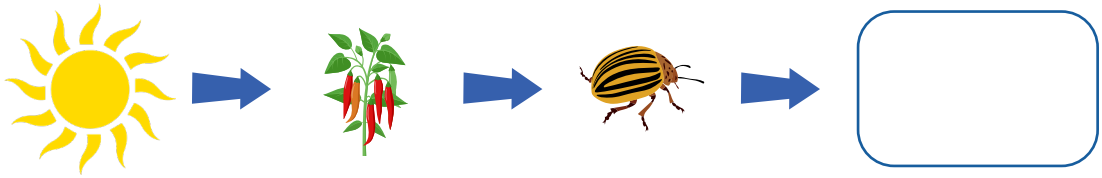
Food chain example:



Draw pictures in the blanks to complete your own food chain.

1. 

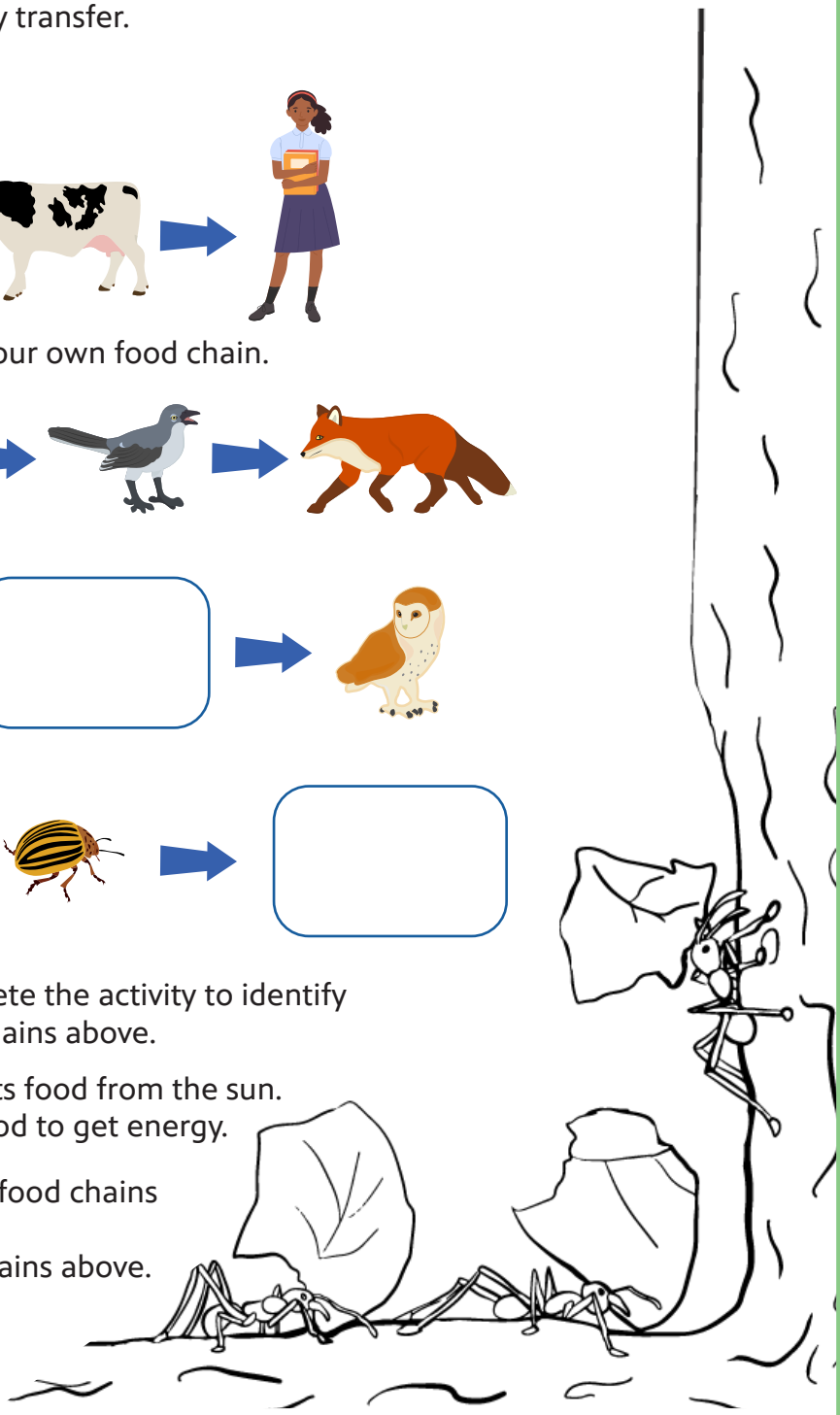
2. 

3. 

B. Read the definitions below. Then complete the activity to identify producers and consumers in the food chains above.

A **producer** is an organism that makes its food from the sun.
A **consumer** is an organism that eats food to get energy.

1. Draw a star above all producers in the food chains above.
2. Circle all the consumers in the food chains above.

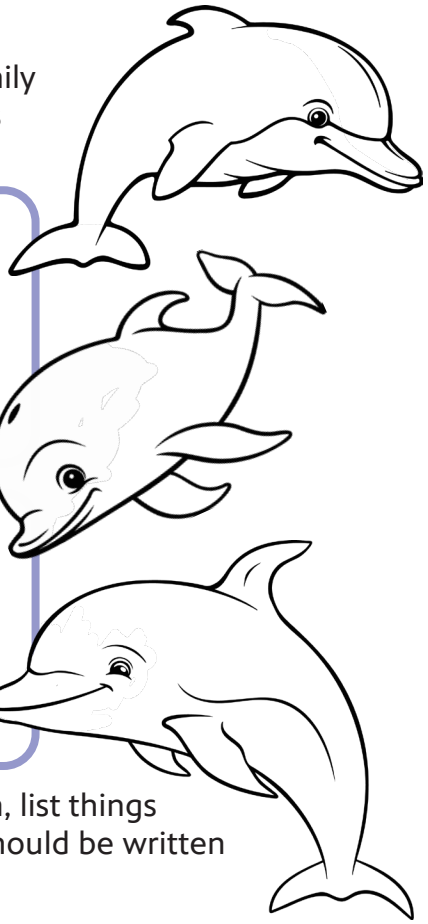


Answers: A. Answers will vary but may include 1-flower or seeds, 2-rabbit or mouse, 3- bird or fish; B. 1-Stars should be drawn above the second box in each food chain. 2-Circles should be drawn around the last two boxes in each food chain.

Animals in Groups (3-5)

Power Goal: Describe how groups help animals survive.

Learning Choices: Many animals live and travel in groups. Groups provide protection from predators, help with hunting prey, and create family groups that are important for survival. Below are two examples of animals that live in groups.



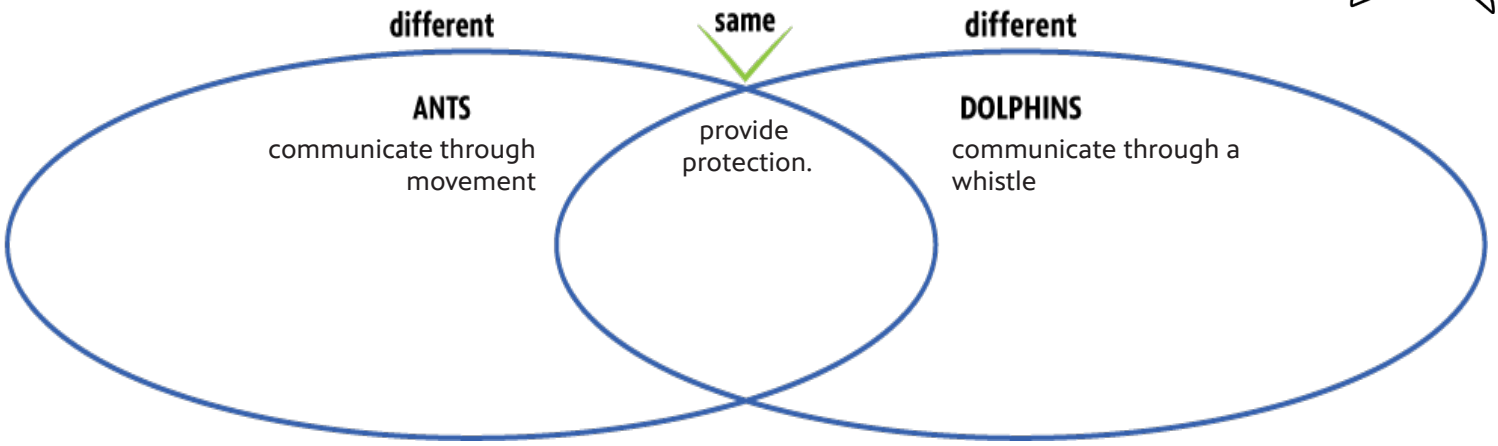
Ants

Ants live in a group called a colony. The colony consists of thousands and thousands of ants. The colony has a queen ant that oversees all the other ants. Every ant has an important role to keep the colony healthy. Colony roles include building tunnels, protecting the colony, and finding food. Ants can't hear, but they feel movement.

Dolphins

Dolphins live in groups called pods. A pod of dolphins can be as small as five or as large as 100. Pods give dolphins protection from predators. Dolphins protect one another and stick together while swimming throughout the ocean. Dolphins hunt together in their pods. Dolphins communicate in their pods with a special whistle sound.

A. Compare and contrast the two animals above. Using the Venn diagram, list things about each of the animals above. Any characteristics that they share should be written where the circles overlap.



B. List two ways that living in groups is important for survival.

_____

_____

Answers: A. ants: live in groups, groups are called colonies, thousands in the colony, has a queen, every ant has a role or job, each helps the group, not all gather food; dolphins: live in pods, 5-100 in a pod, use the pod for protection, all hunt together; both: live in groups, provide protection, work together, can communicate B. Answers should include that groups provide shelter, protection, and/or food.

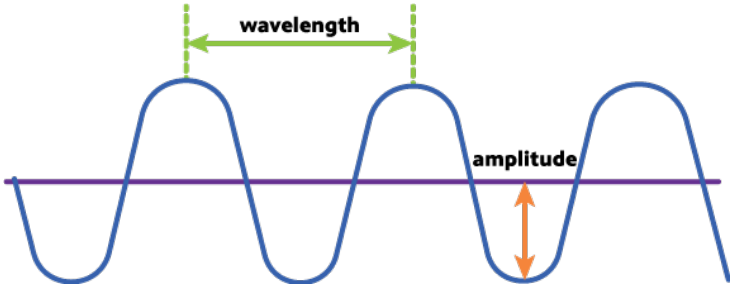
Riding the Waves (3-5)

Power Goal: Create models to describe patterns of amplitude and wavelength.

Learning Choices: **Waves** are a pattern of motion that transfers energy. A few forms of waves are sound, light, and water. Waves can be described by amplitude, wavelength, and volume.

Amplitude is the measure of a wave's height. Amplitude tells us how much energy the wave has. The higher a wave's amplitude is, the greater its volume is.

Wavelength is the distance between two waves. Shorter distances between waves show greater energy.

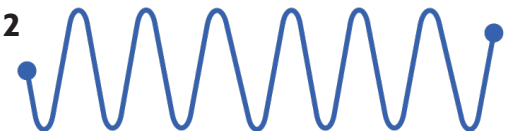


Wave	Amplitude	Wavelength	Volume
	high amplitude	short wavelength	loud volume
	low amplitude	long wavelength	quiet volume

A. Identify traits of a wave.

Wave 1

Wave 2



1. Circle the wave with the higher amplitude.
2. Put a star in the box of the wave with the longer wavelength.
3. Put an x in the box with the louder volume.

B. Draw your own waves for each situation in the boxes below.

1. You strum loudly on a guitar.	2. A whale makes a long, deep call in the ocean.

Answers: A. 1-wave 2, 2-wave 1, 3-wave 2; B. 1-Wave should have high amplitude and short wavelengths. 2-Wave should have low amplitude and long wavelengths.

Energy Transfer (3-5)

Power Goal: Predict outcomes about the changes in energy that occur when objects collide.

Learning Choices: **Energy** is the ability to make things happen and cause change. Energy can transfer from one object to another.

1. The boy kicks the ball. This transfers the energy from the boy to the ball.

2. The ball transfers the energy from the kick to the net and then bounces back.

3. The ball hits the ground, transferring the remaining energy to the ground.

Newton's Cradle is a pendulum that represents the effects of balls colliding. Let's explore this pendulum further and see how it relates to energy.

A. Observe the actions of the balls represented in the pictures of a Newton's Cradle below. Record what you see.

Record your observations.	1. 	2. 	3. 	4. 

5. What happened to the energy from the ball that is pulled back in the second picture?

B. You roll a bowling ball towards three bowling balls sitting still. Write what you think will happen when they collide. Draw arrows if it helps.

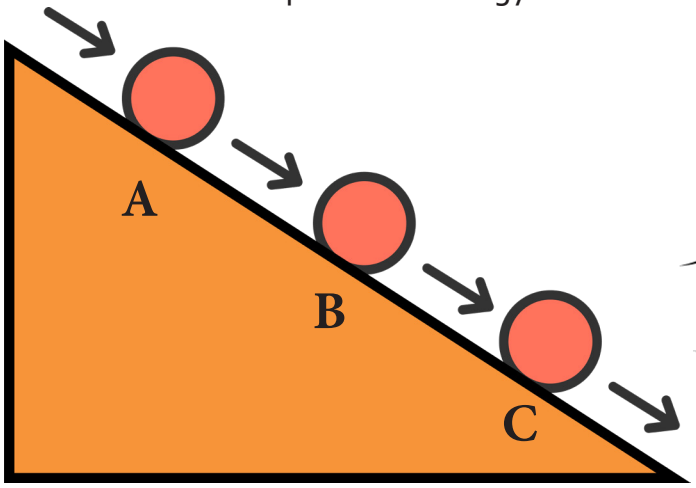
Answers: A. Answers may vary but should include something like 1. The balls are still. 2. The ball on one end is moved back 3. The balls are still. 4. The ball on the far end is pushed forward 5. The energy of the ball in the second picture is transferred through the other balls to the ball on the far end. B. The energy will transfer through the other balls to make the ball on the right move to the right.

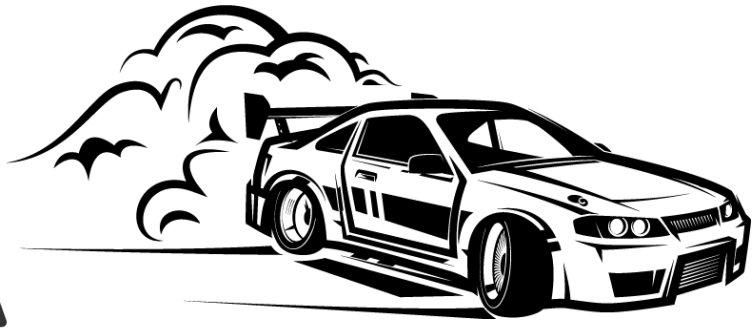
More Energy, More Speed (3-5)

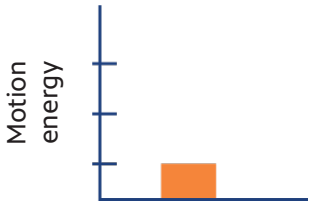
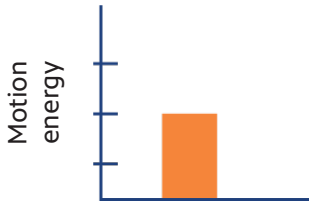
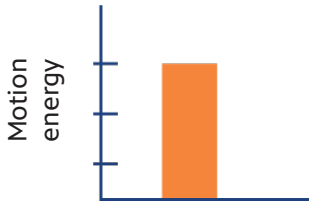
Power Goal: Explain the relationship between speed and energy of a ball in motion.

Learning Choices: When an object is in motion, it has both speed and energy. **Speed** is a measurement of how fast an object moves. **Energy** is the ability to work, make changes, and cause things to happen. How are speed and energy related?

A. Let's look at the speed and energy of a ball rolling down a hill.





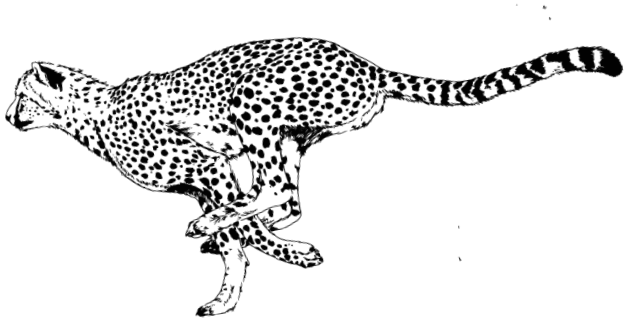
	A	B	C
Speed	**5 m/s**	**25 m/s**	**30 m/s**
Energy			

Use the chart above to answer the following questions:

1. What happens to the speed of the ball from A to C?
2. What happens to the energy of the ball from A to C?

B. Circle the correct statement.

1. As speed increases, energy decreases.
2. As speed decreases, energy increases.
3. As speed increases, energy increases.



Answers: A. 1-The speed of the ball increases. 2-The energy of the ball increases.
B. Number 3 should be circled.

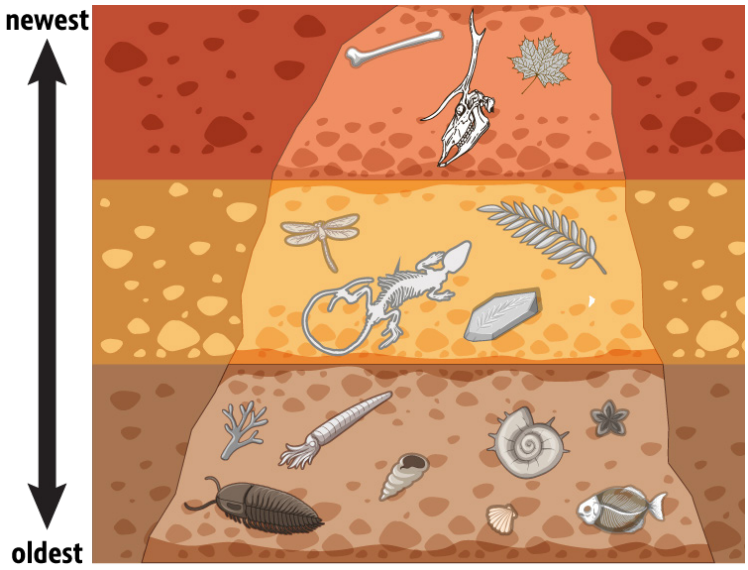
Figuring Out Fossils (3-5)

Power Goal: Analyze and interpret fossils to determine different types of organisms and their environment.

Learning Choices: A person who studies fossils is called a **paleontologist**. Paleontologists use fossil evidence to make interpretations about the **environments**, or physical surroundings of the Earth, that the fossils lived in.

Today, you will become a paleontologist! Below is documentation from a recent discovery of fossils. There are three layers. Each layer represents a different period. The top layer consists of the most recent fossils, and the bottom layer consists of the oldest fossils.

A. Analyze each layer. Next to each layer, write what organisms you see.



1.

2.

3.

B. Interpret your findings. Answers the questions below.

1. How are the fossils in the top layer different from the fossils in the bottom layer?

2. What do the findings suggest about the environment where the fossils were discovered?

Answers: A. 1-plants, larger mammals, and reptiles; 2-small land animals, plants, and insects; 3-fish, shells, and marine life; B. 1-The fossils in the deepest layer consist of more marine life. 2-The Earth was covered by more water and therefore had more marine life in the early days.

Family Power Hour

Nature Exploration

Exploring nature is good for your curiosity. It also builds your imagination. There are many neat things in nature to see, and all you have to do is look and explore. Here are some fun activities for you to do with your family as you explore nature around you! You can choose one activity, or you can do them all. Make sure you are with a parent, guardian, or trusted adult when you complete the activities.

Patterns, Shapes, and Colors! Oh My!

There are many shapes and colors that can be found in nature. Flowers, clouds, and animals are all things found in nature that contain a pattern, shape, or color. In this activity, you and your family can go outside and search for shapes, colors, and patterns in nature. From clouds to trees, to rocks and leaves, you can find shapes, colors, and patterns anywhere you look.

See the Seeds!

In this activity, you and your family can go outside and look for various seeds. When you think of seeds, you may think of something like sunflower seeds or apple seeds. However, there are other seeds all throughout nature. Some examples include acorns, walnuts, pinecones, pecans, soybeans, and more! You can make your own collection of seeds you find in nature. You can even use some seeds you find to plant and grow.

Sounding it Out!

There are many different sounds to listen to in nature such as bird calls, insects, and the force of wind. While you and your family are out in nature, listen to all the sounds around you and try to identify what is making each sound. How many sounds do you hear? What sound is the loudest? Do you hear any repeated sounds or sound patterns? Sometimes sounds can create vibrations that you can feel. Challenge yourself to see if you can feel any of those vibrations from the sounds of nature today.

Hey, parents! If you post any pictures while you and your family are out exploring nature, tag us!
#ARFamilyPowerHour #RiseandShineAR

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Helping ALL Learners

While you are working with children to boost their learning, consider these tips and tools to help all learners.

Skill	Strategy/Resource	Description
Communication	Helping	With your help or guidance, allow children to help with chores and everyday tasks, including things such as talking with salespeople or checking out at a store.
Writing	Chunking Writing Tasks	Instead of asking children to write an entire piece, divide it into smaller parts.
Writing	Talk It Out	If a child needs help with writing, allow them to talk through their answers in other subject areas such as math or science instead of having them write their answers.
Reading	Chunking Text	Break long texts into shorter sections. Have children read or listen to one section at a time, pausing to discuss or write about each one before reading the next.
Reading	Build Background Knowledge Prior to Reading	Before having a child read a text or story, consider what vocabulary words or ideas they might be unfamiliar with and explore those together, first.
Reading in Math	Read Aloud	For children who need help with reading, reading math problems to them will help them focus on the problem without struggling to understand it.
Math	Manipulatives	Children can work through a math problem by moving around small household objects such as building blocks, pencils, coins, rocks, beans, cereal, etc.
All	Different Ways of Knowing	Encourage learning activities involving multiple senses and types of intelligences, such as:

- Nature Spotlight: Take a walk and write down what you see, smell, hear, and sense through touch.
- Body Movement Spotlight: Create a dance or athletic routine.
- Word Spotlight: Create a poem or a set of jokes using the power words.
- People Spotlight: Get with family members or friends and play or make a game, complete a puzzle, or put on a performance.
- Self Spotlight: Express your feelings by building or creating something, drawing, or writing a journal entry.
- Number Spotlight: Using an everyday object, measure different things in/around your home (example: the chair is 12 forks tall).
- Musical Spotlight: Read books to the tune of different genres of music.
- Visual/Creative Spotlight: Draw or sketch something you learned.
- Technology Spotlight: Create a presentation/game to show your learning.

For our full list of tips, including links to online resources, visit myarpbs.org/helpinglearners

myarkansaspbs.org/riseandshine (English)
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