### Earth & Space Science

Grade 3 - Rocks & Soil 3ES.C.4 3ES.C.5 3ES.C.6 True or False? Soils are different from What part of the soil is made of up decayed place to place. What kind Different soil types hold of soil would you expect to remains of plants and different amounts of water. find in a desert? animals? 3ES.C.3 3ES.C.1 3ES.C.1 Name **ONE** way weather True or False? True or False? can break down rocks. Geologists group rocks by Size is a considered a their taste. property of rocks. 3ES.C.1/2/6 3ES.C.1/6 3ES.C.4 \$100 True or False? True or False? Name **ONE** thing that you might find when digging a Rocks and soil are always Soil and rocks can both be hole that is **NOT** a natural the same found in layers. part of the soil. 3ES.C.3 3ES.C.1 3ES.C.2 True or False? Name **ONE** rock property When rocks form in layers, that helps geologists which layer is most often The actions of plants and identify different kinds of the youngest? weather can break big rocks? rocks into smaller rocks.

			Grade 3 - Rocks & Soil
	3ES.C.1	3ES.C.1	3ES.C.6
\$20	Name <b>TWO</b> useful properties for identifying a mineral.	Describe <b>TWO</b> ways rock layers can be identified.	Identify (name) the layer of soil just below ground level.
	3ES.C.2	3ES.C.4	3ES.C.4
\$200	How do rivers and streams impact the formation of rocks?	Name <b>TWO</b> things that are a natural part of the soil that you might find when digging a hole.	Soil is made of many parts.  Name two things you can find in soil.
	3ES.C.5	3ES.C.4	3ES.C.1/2
\$200	Identify the type of soil that BEST retains (holds) water.	At the end of a plants life it will wither and start to decompose. When plants decompose, what happens to them?	Sedimentary rocks are formed by bits of rocks and soil that settle together and harden into new rock. What type of pattern do the rocks and soil settle in?
	3ES.C.3	3ES.C.4	3ES.C.4
\$200	Rocks and plants are often found together in the environment. Rocks can shelter plants from harsh weather and give them a place to grow. How can plants cause changes in rocks?	A farmer sees an area of land that he believes would be good for farming because of the topsoil.  Name a process that contributed to forming this topsoil.	Fossil fuels were formed millions of years ago from the remains of what?

### Earth & Space Science

Grade 3 - Rocks & Soil

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Identify (name) the **THREE** types of soil.

Sedimentary rocks are most likely to be found in layers. What are **TWO** things that are needed to form sedimentary rocks?

3ES.C.1

Identify (name) **THREE** properties of rock.

3ES.C.5

3ES.C.5

A soil scientist is helping a woman improve her farm. The scientist believes that there may be dangerous chemicals spilled in the field. What tools should the scientist use to investigate the soil?

3ES.C.3

3ES.C.2

Describe **TWO** ways that large rocks are broken down into small rocks and small rocks are broken down into even smaller rocks.

3ES.C.4

Through observation, scientists have discovered that soil is composed of many different things. List **THREE** things that are a natural part of soil.

# \$300

3ES.C.3

How does wind breakdown rocks?

3ES.C.5/6

Some students are studying the amount of water absorbed by different soils. At the start of their experiment they dry all the soils in an oven. Why do they start the experiment by drying all the soil samples?

3ES.C.1

Students are asked to organize a large collection of rocks. Name three ways students could organize the rocks based on different properties.

### Earth & Space Science

Grade 3 - Rocks & Soil

# \$400

3ES.C.6

3ES.C.3

3ES.C.5

When workmen dug several feet under the street outside a school, students noticed the soil was light brown and very hard. When the class planted a garden nearby, they observed the soil a few inches deep was dark and soft. What can explain the differences in soil?

### 3ES.C.5

Some students are planting a garden behind their classroom. They want to find the best location for their garden based on the condition of the soil. Describe four properties of soil the students should examine.

### 3ES.C.5

A student conducts an experiment.

She puts a different type of soil in four pots. Each pot has a hole in the bottom. She then puts the same amount of water in each pot. A different amount of water drains out of each pot. Name a conclusion that might be reached from this experiment?

# \$400

Describe how the actions of plants **and** weather can cause the breakdown of larger rocks into smaller rocks?

### 3ES.C.1

One rock in a students' collection is a dark, heavy piece of granite. It has many large crystals. How did this rock probably form?

### 3ES.C.6

The police arrested a person they suspected of a crime. The police scraped soil from the suspect's shoes for evidence that he was at a certain location. Why did the police decide to scrape his shoes?

# \$400

A student wanted to grow seeds.
She put clay soil and a few seeds in a medium sized pot. The pot did not have a drain hole. The student packed the soil as tight as she could and watered the seeds every day.
The plant did not grow. What is most likely the problem?

3ES.C.2

What information about Earth's history do rock layers provide?

### 3ES.C.6

A gardener moved from Ohio to Michigan and is growing a new garden in Michigan just like the one at his old home in Ohio. The seasons and the weather are the same, but his favorite plants are not growing well. His garden is sunny and he waters it carefully. What could be the problem with his plants?

			e 4 - Weather/Processes that Shape the Earth
	4ES.B.8	4ES.D.1	4ES.B.8
\$100	Name the process that happens when oceans pick up sand and soil from the shore?	A student's hair begins to move when the student steps outside. What is most likely causing the hair to move?	True or False? Wind blowing sand over rocks is an example of weathering?
	4ES.D.2	4ES.B.10	4ES.B.8
\$100	Which part of the water cycle takes the form of rain, hail, sleet or snow?	Identify <b>ONE</b> fast process that quickly changes the Earth's surface.	Sand is carried to the beach by waves and dropped on the shore. What is this process called?
	4ES.D.3/5	4ES.B.10	4ES.B.9
\$100	It snowed in the morning and rained in the afternoon. What must have changed?	Name one process that takes a long time to change the Earth's surface?	Identify the process that shapes pot holes (holes in roads)?
	4ES.D.3	4ES.D.4	4ES.D.4
\$100	What happens when water vapor in the air starts to condense?	What tool measures air pressure?	What tool measures wind?

			e 4 - Weather/Processes that Shape the Earth
	4ES.B.8	4ES.B.9	4ES.B.8
\$200	Identify the landform that occurs at the end of a river.	Describe one possible effect of water freezing and thawing in the cracks of a rock?	What causes the greatest amount of erosion in a river valley?
	4ES.D.6	4ES.B.8	4ES.D.7
\$200	Identify <b>TWO</b> slow processes that take millions of years to change Earth's landforms.	Identify <b>ONE</b> landform a glacier might create.	Identify the high wispy clouds that often signal cool and mostly clear weather.
	4ES.D.6	4ES.D.6	4ES.B.10
\$200	Weather patterns in the United States generally move in what direction?	A student notices that Ohio has the same weather a few days later than Indiana does. The weather conditions are similar in both states because weather generally travels in which directions?	Identify a slow process that might create a canyon.
	4ES.D.7	4ES.D.7	4ES.D.7
\$200	Identify the type of cloud that is likely with thunderstorms.	Identify the type of cloud that will likely be seen during a grey, rainy day.	Identify the fluffy, lower clouds that are often signal cool and mostly clear weather.

			e 4 - Weather/Processes that Shape the Earth
	4ES.D.2	4ES.D.2	4ES.B.10
\$300	Name the 3 stages of the water cycle.	Name 3 different types of precipitation.	Name <b>THREE</b> rapid processes that shape the Earth's surface.
	4ES.D.1/2/3	4ES.B.8	4ES.D.5
\$300	The Earth gets energy from the sun. What Earth system does the sun power?	Sand dunes are found near Lake Michigan. What formed these sand dunes?	List <b>THREE</b> ways a student might use a standard way to measure the weather?
\$300	Steam is one example of air that has water in it.  Name a natural event that also shows air has water in it.	It is a snowy day in Ohio and a Columbus student calls her grandmother in New York City to tell her about the fun she had playing in the snow. Her grandmother says, "I had better get ready for snow here in New York." Why does the grandmother think there will be snow soon in New York City?	Mountains form very slowly over time. Name one way a mountain can be formed.

		Grad	e 4 - Weather/Processes that Shape the Earth
	4ES.D.3	4ES.B.10	4ES.D.4
\$400	Name <b>FOUR</b> different types of precipitation.	Name <b>FOUR</b> slow processes that shape the Earth's surface.	Each day of the week, a group of students observed the windsock located at the back of their school. Describe what the windsock would look like on a very windy day.
	4ES.D.1	4ES.D.5	4ES.B.10
\$400	Students were blowing up a balloon for a surprise party for their teacher. Explain what gives a blown up balloon its shape.	Name <b>FOUR</b> types of information found on a weather map.	A student goes to the same summer camp in the mountains of Pennsylvania each year. Why won't she be able to see a change in the mountains when she visits next summer?
	4ES.D.3	4ES.D.1	4ES.B.10
\$400	Using weather terms, describe how water changes from state to state.	Most people say that a cardboard box with nothing in side is "empty." But it still has air inside. Describe evidence that air is around us and takes up space.	Some processes that change the earth's surface are slow and some are fast. Identify and describe one kind slow change and one fast change in the geology of rocks and soil in our planets surface.

			Grade 5 - Universe & Earth Systems
	5ES.A.2	5ES.A.3	5ES.A.3
\$100	During which phase of the moon does the moon appear completely dark when observed from the Earth?	True or False? The surfaces of the Earth and moon both have water.	Some people call Earth "The Blue Planet" or "The Ocean Planet." What is it about Earth that makes this a good name?
	5ES.A.1	5ES.A.2	5ES.A.3
00	What causes Earth to	The Earth follows a curved	True or False?
\$100	experience day and night?	(elliptical) path in space. Where does the Earth's orbit take it?	It takes one year for Earth to resolve around the sun.
	5ES.A.3	5ES.A.2	5ES.A.4
\$100	How much of Earth's surface is covered in water?	How often does the moon completely orbit the earth?	What type of object is the sun?
	5ES.A.3	5ES.A.3	5ES.A.3
\$100	When the Northern hemisphere has spring, what is the season in the Southern hemisphere?	True or False?  Earth has an atmosphere, but the moon does not.	Where is most of the Earth's freshwater located?)

			Grade 5 - Universe & Earth Systems
	5ES.A.1	5ES.A.3	5ES.A.4
\$200	Describe an Earth cycle that occurs daily?	Identify something that is found on both the surface of the Earth and the moon?	What are <b>TWO</b> factors does the brightness of a star depend on?
	5ES.A.3	5ES.A.3	5ES.A.3
\$200	What is the season of a hemisphere that is tilted away from the sun?	What causes the seasons on earth?	Describe one result of the earth's rotation around the sun?
	5ES.A.4	5ES.A.4	5ES.A.2
\$200	How is our sun different from all other stars?	Why do giant stars look small when they are viewed from earth?	Describe what prevents planet's moons from flying off into space?
	5ES.A.2	5ES.A.2	5ES.A.2
\$200	Identify the path the moon takes around the Earth and describe the shape of the path.	Name an object in space that orbits another object.	Explain why you cannot see a new moon.

	<del>,</del>		Grade 5 - Universe & Earth Systems
	5ES.A.4	5ES.A.4	5ES.A.4
\$300	List <b>THREE</b> facts you know about stars.	A scientist studying a star though a telescope thinks she has discovered a planet in distant solar system. She is not yet sure of her result. What is a responsible thing for her to do next?	The planet Venus is about 12,000 km across. The star Vega is about 3,800,000 km across. Why does Venus look brighter than Vega in the night sky?
	5ES.A.1	5ES.A.2/4	5ES.A.1
\$300	Explain why Ohio has more daylight hours in the summer months.	Name <b>THREE</b> objects that make up our solar system.	Explain how you know the Earth rotates on its axis?
	5ES.A.2	5ES.A.2	5ES.A.3
\$300	Explain how the craters on the moon's surface are formed?	Explain why gravity is important to the solar system.	Why are there more hours of daylight in the summer (in the Northern Hemisphere) than there are in the winter?

			Grade 5 - Universe & Earth Systems
	5ES.A.4	5ES.A.2	5ES.A.4
\$400	If you were going to build a scale model of the solar system, which part of your model would be the largest?	Give one similarity between the earth and the moon's surface. Describe how the surface of the earth and moon are formed differently.	The diameter for the star Betelgeuse is over 100 times greater than the diameter of the star Bellatrix. Why do the two stars look the same size in the night sky even though one is so much larger than the other?
	5ES.A.2	5ES.A.1	5ES.A.1/2.D.2
\$400	Students in a science class were asked to observe the phases of the moon. How does the moon travel through space? Describe the phases of the moon.	The sun is directly overhead on a tropical island. In twelve hours, where will the sun be in the sky?	The sun plays an important role in every part of nature. Describe <b>THREE</b> effects of the energy of the sun on the Earth.
	Describe how the	Identify and describe the	In which layer of Earth's
\$400	movements of earth cause us to experience night and day. Include in your description why a day is 24 hours long and what causes darkness and light.	TWO factors that cause the seasons on Earth.	atmosphere does most of the weather occur?

			Grade 5 - Renew & Reuse
	5ES.C.6	5ES.C.6	5ES.C.6
\$100	What major resource in building homes is renewable?	True or False? Paper is a renewable resource. By recycling paper we reduce the number of trees needed to make the paper we use.	True or False?  Fresh water is a non-renewable resource?
	5ES.C.5	5ES.C.5	5ES.C.5
0	Oil, natural gas, and coal were	A teacher created a list of	True or False?
\$100	formed millions of years ago from the remains of plants and animals. What type is this type of fuel called?	resources: falling water, sunlight, wind, and fossil fuels. Which one is not a renewable resource?	Using a reusable water bottle is one way to conserve the natural resources.
	5ES.C.5	5ES.C.6	5ES.C.5
\$100	A teacher wants to use an inexhaustible resource to heat his home. What energy source could he use?	True or False?  Fresh water is a renewable resource.	Identify why making aluminum cans from recycled materials instead of raw materials is a wise choice.
	5ES.C.6	5ES.C.5	5ES.C.6
\$100	True or False?  Renewable energy resources are those that do not run out.	Describe why carpooling is a good way to conserve resources.	List <b>ONE</b> way you can renew, reuse, or recycle.

			Grade 5 - Renew & Reuse
	5ES.C.5	5ES.C.6	5ES.C.5
\$200	Although fossil fuels are still forming, why are these fuels considered nonrenewable resources?	2.8% of Earth's water is freshwater. Where do we find most of this water?	How does recycling affect a non-renewable resource such as the metal copper?
	5ES.C.5	5ES.C.5	5ES.C.6
\$200	List <b>TWO</b> energy sources that fossil fuels provide.	Many people throw out almost five pounds of trash each day. How could everyone decrease the amount of trash thrown away daily?	What would be the most important reason for recycling paper?)
	5ES.C.6	5ES.C.5	5ES.C.5
\$200	Why is a tree considered a renewable resource?	List <b>TWO</b> ways to extend our supply of nonrenewable resources?	How is conservation like keeping resources?
	5ES.C.5	5ES.C.6	5ES.C.5
\$200	A student gives her outgrown jacket to her younger sister. Identify the type of conservation she used?	Name <b>TWO</b> renewable resources.	Describe the process for recycling a glass jar?

F			Grade 5 - Renew & Reuse
	5ES.C.5	5ES.C.6	5ES.C.5
\$300	Name <b>THREE</b> ways people can extend the use of non-renewable resources.	List <b>THREE</b> renewable resources.	List <b>THREE</b> non-renewable resources.
	5ES.C.5	5ES.C.6	5ES.C.5
\$300	When we recycle newspapers we are extending the use of the trees from which the paper was made. How is this similar to the recycling of aluminum cans?	List <b>THREE</b> human actions that can help conserve a renewable resource.	Identify <b>THREE</b> effects of reusing items instead of throwing them out?
	5ES.C.5  True or False?	5ES.C.6	5ES.C.6
\$300	A student knows that fossil fuels are formed from the remains of dead plants and animals. She believes we can easily create more fossil fuels. Explain why this true or false?	Explain the meaning of recycling.	Identify the meaning of this symbol.

			Grade 5 - Renew & Reuse
	5ES.C.6	5ES.C.6	5ES.C.5
\$400	Many scientists are working on ways to gather the Sun's energy and use it for heat, electricity, and power. Although using solar energy has a lot of potential, there are also problems. What is one problem with solar energy?	Where is most of Earth's available fresh water found?	Metals, such as aluminum, iron, nickel, and copper, are all nonrenewable resources.  Draw a conclusion about why it is important for metals to be reused and recycled.
	5ES.C.6	5ES.C.6	5ES.C.5
\$400	How are renewable resources different from nonrenewable resources?	Solar, biomass, geothermal, wind, and hydropower energy are all renewable sources of energy. Why are they considered renewable?	Coal, petroleum, natural gas, and propane are fossil fuels. How were fossil fuels formed?
	5ES.C.5	5ES.C.5	5ES.C.5
\$400	Where does the energy in fossil fuels come from?	Explain how you can reduce, reuse, and recycle to avoid wasting plastic shopping bags.	List <b>FOUR</b> specific things you could do to reduce the amount of solid waste in a garbage can?

# Teacher Answerkey

### Earth & Space Science

Grade 3 - Rocks & Soil 3ES.C.4 3ES.C.5 3ES.C.6 True or False? Soils are different from place to What part of the soil is made of up place. What kind of soil would you decayed remains of plants and Different soil types hold different expect to find in a desert? animals? amounts of water. (sandy soil) (humus) (true) 3ES.C.3 3ES.C.1 3ES.C.1 \$100 Name **ONE** way weather can break True or False? True or False? down rocks Geologists group rocks by their Size is a considered a property of (e.g., expanding/contracting of taste. rocks. water in cracks due to freezing and thawing, plant roots) (false) (false) 3ES.C.1/2/6 3ES.C.1/6 3ES.C.4 \$100 True or False? True or False? Name ONE thing that you might find when digging a hole that is **NOT** a Soil and rocks can both be found in Rocks and soil are always the same natural part of the soil. layers. (false) (e.g., eraser from pencil, bottle top) (true) 3ES.C.1 3ES.C.3 3ES.C.2 True or False? Name **ONE** rock property that helps When rocks form in layers, which geologists identify different kinds of layer is most often the youngest? The actions of plants and weather rocks? can break big rocks into smaller (top layer) rocks. (e.g., color, texture, layers) (true)

			Grade 3 - Rocks & Soil
	3ES.C.1	3ES.C.1	3ES.C.6
\$200	Name <b>TWO</b> useful properties for identifying a mineral.	Describe <b>TWO</b> ways rock layers can be identified.	Identify (name) the layer of soil just below ground level.
\$	(hardness, color, streak test)	(color, texture)	(humus)
	3ES.C.2	3ES.C.4	3ES.C.4
\$200	How do rivers and streams impact the formation of rocks?  (moving water helps break the rock into bits and then carries the rocks bits to new places where they become layers of sediment that form rocks)	Name <b>TWO</b> things that are a natural part of the soil that you might find when digging a hole.  (e.g., rotting twig from a tree, an old bird's nest, piece of bark that fell from a tree)	Soil is made of many parts. Name two things you can find in soil.  (e.g., small rocks, decomposed plants and animals and products of plants and animals)
	3ES.C.5	3ES.C.4	3ES.C.1/2
\$200	Identify the type of soil that BEST retains (holds) water.  (clay)	At the end of a plants life it will wither and start to decompose. When plants decompose, what happens to them?  (they break down and become part of the soil)	Sedimentary rocks are formed by bits of rocks and soil that settle together and harden into new rock. What type of pattern do the rocks and soil settle in?
·		The selly	(horizontal layers)
	3ES.C.3	3ES.C.4	3ES.C.4
\$200	Rocks and plants are often found together in the environment. Rocks can shelter plants from harsh weather and give them a place to grow. How can plants cause changes in rocks?	A farmer sees an area of land that he believes would be good for farming because of the topsoil. Name a process that contributed to forming this topsoil.	Fossil fuels were formed millions of years ago from the remains of what?  (plants and animals)
	(plant roots can break rocks apart into smaller rocks)	(decaying plant life, decaying animal life)	

### Earth & Space Science

Grade 3 - Rocks & Soil

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Identify (name) the **THREE** types of soil.

(sand, silt, clay)

### 3ES.C.2

Sedimentary rocks are most likely to be found in layers. What are **TWO** things that are needed to form sedimentary rocks?

(e.g., wind, water, pressure)

### 3ES.C.1

Identify (name) **THREE** properties of rock.

(color, layer, texture, hardness)

# \$300

### 3ES.C.5

3ES.C.5

A soil scientist is helping a woman improve her farm. The scientist believes that there may be dangerous chemicals spilled in the field. What tools should the scientist use to investigate the soil?

(e.g., gloves, apron, magnifying glass)

### 3ES.C.3

Describe **TWO** ways that large rocks are broken down into small rocks and small rocks are broken down into even smaller rocks.

(e.g., water freezing inside the crack of a large rock, wind moving across a rock in the desert, roots from a tree growing into a rock)

#### 3ES.C.4

Through observation, scientists have discovered that soil is composed of many different things. List **THREE** things that are a natural part of soil.

(decayed tree limb, small pieces of rock, decayed leaves, dead animals)

# \$300

### 3ES.C.3

How does wind breakdown rocks?

(e.g., wind picking up sand and then smashing it against rocks slowly chips away at rocks, wind can push rocks down cliff/hill where they can be broken during the fall)

### 3ES.C.5/6

Some students are studying the amount of water absorbed by different soils. At the start of their experiment they dry all the soils in an oven. Why do they start the experiment by drying all the soil samples?

(to fairly compare the soils)

### 3ES.C.1

Students are asked to organize a large collection of rocks. Name three ways students could organize the rocks based on different properties.

(color, texture, patterns of layering or hardness)

### Earth & Space Science

Grade 3 - Rocks & Soil

# \$400

### 3ES.C.6

When workmen dug several feet under the street outside a school, students noticed the soil was light brown and very hard. When the class planted a garden nearby, they observed the soil a few inches deep was dark and soft. What can explain the differences in soil?

(different layers of soil have different properties)

### 3ES.C.5

Some students are planting a garden behind their classroom. They want to find the best location for their garden based on the condition of the soil. Describe four properties of soil the students should examine.

(color, texture, the capacity to retain water, ability to support plant growth)

### 3ES.C.5

A student conducts an experiment. She puts a different type of soil in four pots. Each pot has a hole in the bottom. She then puts the same amount of water in each pot. A different amount of water drains out of each pot. Name a conclusion that might be reached from this experiment?

(e.g., different soils have different abilities to absorb water)

# \$400

### 3ES.C.3

Describe how the actions of plants **and** weather can cause the breakdown of larger rocks into smaller rocks?

(e.g., the roots of plants can break apart rocks (think tree roots & sidewalks), moving water erodes rocks, freezing/thawing cause cracks/breaks)

### 3ES.C.1

One rock in a students' collection is a dark, heavy piece of granite. It has many large crystals. How did this rock probably form?

(magma that cooled that slowly beneath the earth's surface)

### 3ES.C.6

The police arrested a person they suspected of a crime. The police scraped soil from the suspect's shoes for evidence that he was at a certain location. Why did the police decide to scrape his shoes?

(soil differs from place to place in texture and color)

# \$400

#### 3ES.C.5

A student wanted to grow seeds. She put clay soil and a few seeds in a medium sized pot. The pot did not have a drain hole. The student packed the soil as tight as she could and watered the seeds every day. The plant did not grow. What is most likely the problem?

(the water did not drain properly)

### 3ES.C.2

What information about Earth's history do rock layers provide?

(e.g., The order in which the layers appear show the order in which events took place in Earth's past. Younger, more recent layers, usually lie above older layers)

#### 3ES.C.6

A gardener moved from Ohio to Michigan and is growing a new garden in Michigan just like the one at his old home in Ohio. The seasons and the weather are the same, but his favorite plants are not growing well. His garden is sunny and he waters it carefully. What could be the problem with his plants?

(The soil at his new home is different than at his old home)

			e 4 - Weather/Processes that Shape the Earth
	4ES.B.8	4ES.D.1	4ES.B.8
\$100	Name the process that happens when oceans pick up sand and soil from the shore?  (erosion)	A student's hair begins to move when the student steps outside. What is most likely causing the hair to move?  (wind/blowing air)	True or False? Wind blowing sand over rocks is an example of weathering?  (true)
	4ES.D.2	4ES.B.10	4ES.B.8
\$100	Which part of the water cycle takes the form of rain, hail, sleet or snow?  (precipitation)	Identify <b>ONE</b> fast process that quickly changes the Earth's surface.  (volcanic eruption, earthquake, landslide)	Sand is carried to the beach by waves and dropped on the shore. What is this process called? (deposition)
	4ES.D.3/5	4ES.B.10	4ES.B.9
\$100	It snowed in the morning and rained in the afternoon. What must have changed?  (temperature)	Name one process that takes a long time to change the Earth's surface?  (e.g., weathering, mountain building, deposition)	Identify the process that shapes pot holes (holes in roads)?  (weathering)
	4ES.D.3	4ES.D.4	4ES.D.4
\$100	What happens when water vapor in the air starts to condense?  (clouds or rain form)	What tool measures air pressure? (barometer)	What tool measures wind? (anemometer)

			e 4 - Weather/Processes that Shape the Earth
	4ES.B.8	4ES.B.9	4ES.B.8
\$200	Identify the landform that occurs at the end of a river.  (delta)	Describe one possible effect of water freezing and thawing in the cracks of a rock?  (rocks crack, break)	What causes the greatest amount of erosion in a river valley?  (moving water)
	4ES.D.6	4ES.B.8	4ES.D.7
\$200	Identify <b>TWO</b> slow processes that take millions of years to change Earth's landforms.  (e.g., deposition, mountain building, erosion, weathering)	Identify <b>ONE</b> landform a glacier might create.  (e.g., glacial moraine, mountain, valley)	Identify the high wispy clouds that often signal cool and mostly clear weather.  (cirrus)
	4ES.D.6	4ES.D.6	4ES.B.10
\$200	Weather patterns in the United States generally move in what direction?  (west to east)	A student notices that Ohio has the same weather a few days later than Indiana does. The weather conditions are similar in both states because weather generally travels in which directions?	Identify a slow process that might create a canyon.  (e.g., erosion, weathering, glacier)
		(west to east)	
	4ES.D.7	4ES.D.7	4ES.D.7
200	Identify the type of cloud that is likely with thunderstorms.	Identify the type of cloud that will likely be seen during a grey, rainy day.	Identify the fluffy, lower clouds that are often signal cool and mostly clear weather.
₩	(cumulonimbus)	(stratus)	(cirrus)

			e 4 - Weather/Processes that Shape the Earth
	4ES.D.2	4ES.D.2	4ES.B.10
0	Name the 3 stages of the water cycle.	Name 3 different types of precipitation.	Name <b>THREE</b> rapid processes that shape the Earth's surface.
\$300	(evaporation- condensation- precipitation)	(e.g., rain, hail, sleet, snow)	(volcanic eruptions, earthquakes, landslides)
	4ES.D.1/2/3	4ES.B.8	4ES.D.5
00	The Earth gets energy from the sun. What Earth system does the sun power?	Sand dunes are found near Lake Michigan. What formed these sand dunes?	List <b>THREE</b> ways a student might use a standard way to measure the weather?
\$300	(the sun helps create the wind and evaporates water in the water cycle)	(wind and water shaped the sand dunes)	(e.g., rainfall every day using a rain gauge, temperature using a thermometer, barometric pressure using a barometer, wind speed using an anemometer)
	4ES.D.2	4ES.D.6	4ES.B.10
\$300	Steam is one example of air that has water in it. Name a natural event that also shows air has water in it.  (e.g., fog, clouds, mist)	It is a snowy day in Ohio and a Columbus student calls her grandmother in New York City to tell her about the fun she had playing in the snow. Her grandmother says, "I had better get ready for snow here in New York." Why does the grandmother think there will be snow soon in New York City?	Mountains form very slowly over time. Name one way a mountain can be formed.  (e.g., movement of the earth's plates, volcanoes)
		(weather patterns move from west to east in the U.S.)	

_				e 4 - Weather/Processes that Shape the Earth
		4ES.D.3	4ES.B.10	4ES.D.4
	\$400	Name <b>FOUR</b> different types of precipitation.  (rain, hail, sleet, snow)	Name <b>FOUR</b> slow processes that shape the Earth's surface.  (erosion, weathering, mountain building, deposition)	Each day of the week, a group of students observed the windsock located at the back of their school.  Describe what the windsock would look like on a very windy day.
	<del>07</del>			(e.g., full of air, sticking straight out - horizontal)
		4ES.D.1	4ES.D.5	4ES.B.10
	\$400	Students were blowing up a balloon for a surprise party for their teacher. Explain what gives a blown up balloon its shape.  (the air inside the balloon take up space and applies pressure to the sides of the balloon)	Name <b>FOUR</b> types of information found on a weather map.  (e.g., barometric pressure, temperature, precipitation symbol, cloud conditions)	A student goes to the same summer camp in the mountains of Pennsylvania each year. Why won't she be able to see a change in the mountains when she visits next summer?  (Mountains change too slowly to show differences after one year)
		4ES.D.3	4ES.D.1	4ES.B.10
	\$400	Using weather terms, describe how water changes from state to state.  (water changes by <i>freezing</i> when temp goes below 0°C (32°F), water changes by <i>melting</i> when temp.	Most people say that a cardboard box with nothing in side is "empty." But it still has air inside. Describe evidence that air is around us and takes up space.	Some processes that change the earth's surface are slow and some are fast. Identify and describe one kind slow change and one fast change in the geology of rocks and soil in our planets surface.
	7\$	goes above 0°C (32°F), water changes states by <b>evaporating</b> when liquid water is changed to water vapor)	(e.g., the wind blows, I can feel it on my face, it moves leaves, sailboats, measured by a barometer, when I flap my arms I can feel it, a balloon)	(SLOW: erosion of rocks and soil by: rivers, weathering, wind and waves and glaciers. SLOW: the formation of rocks and soil by: volcanoes, pressure, heat and sedimentation. FAST: the movement of rocks and soil due to landslides, mudslides, tsunamis, floods, earthquakes, volcanoes)

			Grade 5 - Universe & Earth Systems
	5ES.A.2	5ES.A.3	5ES.A.3
\$100	During which phase of the moon does the moon appear completely dark when observed from the Earth?  (new moon)	True or False?  The surfaces of the Earth and moon both have water.  (false – the moon has no water)	Some people call Earth "The Blue Planet" or "The Ocean Planet." What is it about Earth that makes this a good name?  (Earth's surface is mostly covered
	,		with water ≈75%)
	5ES.A.1	5ES.A.2	5ES.A.3
30 \$100	What causes Earth to experience day and night?  (Earth's rotation on its axis)  5ES.A.3  How much of Earth's surface is covered in water?	The Earth follows a curved (elliptical) path in space. Where does the Earth's orbit take it?  (around the sun)  5ES.A.2  How often does the moon completely orbit the earth?	It takes one year for Earth to resolve around the sun.  (true)  5ES.A.4  What type of object is the sun?
\$100	(approximately ¾ or 75%)	(about a month)	(a star)
	5ES.A.3	5ES.A.3	5ES.A.3
\$100	When the Northern hemisphere has spring, what is the season in the Southern hemisphere?  (fall/autumn)	True or False?  Earth has an atmosphere, but the moon does not.  (true)	Where is most of the Earth's freshwater located? (glaciers and ice caps)

			Grade 5 - Universe & Earth Systems
	5ES.A.1	5ES.A.3	5ES.A.4
\$200	Describe an Earth cycle that occurs daily?  (e.g., Sun rises/sets, Earth makes one complete rotation on axis)	Identify something that is found on both the surface of the Earth and the moon?  (e.g., rocks, mountains, dust)	What are <b>TWO</b> factors does the brightness of a star depend on?  (how far the star is from Earth, how bright the star actually is, the actual size of the star)
	5ES.A.3	5ES.A.3	5ES.A.3
\$200	What is the season of a hemisphere that is tilted away from the sun?  (winter)	What causes the seasons on earth?  (Earth's tilt on it's axis, Earth's revolution around the Sun & position relative to the sun)	Describe one result of the earth's rotation around the sun?  (sun rise/set & the apparent motion of the stars in the sky)
	5ES.A.4	5ES.A.4	5ES.A.2
\$200	How is our sun different from all other stars?  (it is much closer to earth)	Why do giant stars look small when they are viewed from earth?  (they are very far away)	Describe what prevents planet's moons from flying off into space?  (gravity holds the bodies of our solar system together)
0,			, ,
	5ES.A.2	5ES.A.2	5ES.A.2
\$200	Identify the path the moon takes around the Earth and describe the shape of the path.  (orbit, elliptical)	Name an object in space that orbits another object.  (e.g., moon around earth, planets (including Earth) around sun)	Explain why you cannot see a new moon.  (The sunlit side of the moon Is facing away from Earth)

<b>-</b>			Grade 5 - Universe & Earth Systems
	5ES.A.4	5ES.A.4	5ES.A.4
\$300	List <b>THREE</b> facts you know about stars.  (stars are different sizes, have different brightness, the sun is the closest star to Earth, look like points of light, appear to twinkle because of their distance from Earth, Polaris is the North Star)	A scientist studying a star though a telescope thinks she has discovered a planet in distant solar system. She is not yet sure of her result. What is a responsible thing for her to do next?  (She should repeat her observations and try to confirm her discovery)	The planet Venus is about 12,000 km across. The star Vega is about 3,800,000 km across. Why does Venus look brighter than Vega in the night sky?  (because it is closer to Earth)
	5ES.A.1	5ES.A.2/4	5ES.A.1
\$300	Explain why Ohio have more daylight hours in the summer months.  (the tilt of the Earth on it's axis causes Ohio to receive more direct sunlight in the summer)	Name <b>THREE</b> objects that make up our solar system.  (e.g., stars, planets, comets, asteroids, moons)	Explain how you know the Earth rotates on its axis?  (e.g., night and day, the appearance of the movement of the stars/sun)
	5ES.A.2	5ES.A.2	5ES.A.3
\$300	Explain how the craters on the moon's surface are formed?  (craters are formed when large objects hit the moon's surface)	Explain why gravity is important to the solar system.  (the pull of gravity holds the solar system bodies together and keeps planets/moons in their orbits)	Why are there more hours of daylight in the summer (in the Northern Hemisphere) than there are in the winter?  (tilt of Earth on axis)

			Grade 5 - Universe & Earth Systems
	5ES.A.4	5ES.A.2	5ES.A.4
\$400	If you were going to build a scale model of the solar system, which part of your model would be the largest?  (the sun)	Give one similarity between the earth and the moon's surface. Describe how the surface of the earth and moon are formed differently.  (The moon and earth's surfaces are covered with plains, mountains, valleys, and craters. Earth's surface is formed by earthquakes, volcanoes, weathering and erosion. The only way the surface of the moon changes is by being hit by objects from space.	The diameter for the star Betelgeuse is over 100 times greater than the diameter of the star Bellatrix. Why do the two stars look the same size in the night sky even though one is so much larger than the other?  (They are so far away that they both look like points of light
	5ES.A.2	5ES.A.1	5ES.A.1/2.D.2
\$400	Students in a science class were asked to observe the phases of the moon. How does the moon travel through space?  Describe the phases of the moon.  (The moon orbits the Earth, and together they both orbit the sun.  PHASES (Full, 1st quarter, crescent, new, crescent, 3rd quarter, full)	The sun is directly overhead on a tropical island. In twelve hours, where will the sun be in the sky?  (overhead when viewed from a location on the other side of Earth)	The sun plays an important role in every part of nature. Describe <b>THREE</b> effects of the energy of the sun on the Earth.  (evaporation & powers the water cycle, light in daytime, energy to plants, heats oceans, land, air & powers wind, angle of sun causes seasons) – A1/D3/A2
	5ES.A.1	5ES.A.3	5ES.A.3
\$400	Describe how the movements of earth cause us to experience night and day. Include in your description why a day is 24 hours long and what causes darkness and light.  (The earth's rotation causes night and day, rotation lasts 24 hours, dark and light depends on which side of Earth is facing the sun)	Identify and describe the <b>TWO</b> factors that cause the seasons on Earth.  ( tilt of Earth on axis effects the amount of direct sunlight & the revolution effects the position of the earth around the sun)	In which layer of Earth's atmosphere does most of the weather occur?  (troposphere)

			Grade 5 - Renew & Reuse
	5ES.C.6	5ES.C.6	5ES.C.6
0	What major resource in building	True or False?	True or False?
\$100	homes is renewable? (lumber)	Paper is a renewable resource. By recycling paper we reduce the number of trees needed to make the paper we use.  (true)	Fresh water is a non-renewable resource?  (False)
	5ES.C.5	5ES.C.5	5ES.C.5
\$100	Oil, natural gas, and coal were formed millions of years ago from the remains of plants and animals. What type is this type of fuel called?	A teacher created a list of resources: falling water, sunlight, wind, and fossil fuels. Which one is not a renewable resource?	True or False?  Using a reusable water bottle is one way to conserve the natural resources.
	(fossil fuels)	(fossil fuels)	(true)
	5ES.C.5	5ES.C.6	5ES.C.5
\$100	A teacher wants to use an inexhaustible resource to heat his home. What energy source could he use?  (e.g., wind power, solar power)	True or False? Fresh water is a renewable resource. (True)	Identify why making aluminum cans from recycled materials instead of raw materials is a wise choice.  (reduces pollution)
	5ES.C.6	5ES.C.5	5ES.C.6
\$100	True or False?  Renewable energy resources are those that do not run out.  (True)	Describe why carpooling is a good way to conserve resources.  (Less driving would use less fossil fuels)	List <b>ONE</b> way you can renew, reuse, or recycle.  (e.g., walk or bike, use a refillable water bottle, collect and recycle aluminum cans or newspaper)

		Grade 5 - Renew & Reuse
5ES.C.5	5ES.C.6	5ES.C.5
Although fossil fuels are still forming, why are these fuels considered nonrenewable resources?	2.8% of Earth's water is freshwater. Where do we find most of this water?	How does recycling affect a non- renewable resource such as the metal copper?
(Fossil fuels cannot be replaced and their supply is limited)	(ice caps and glaciers)	(recycling extends the lifetime of the supply of copper)
5ES.C.5	5ES.C.5	5ES.C.6
List <b>TWO</b> energy sources that fossil fuels provide.	Many people throw out almost five pounds of trash each day. How	What would be the most important reason for recycling paper?
(heat energy and electricity)	amount of trash thrown away daily?	(Fewer trees would be cut down)
	(recycle materials)	
5ES.C.6	5ES.C.5	5ES.C.5
Why is a tree considered a renewable resource?	List <b>TWO</b> ways to extend our supply of nonrenewable resources?	How is conservation like keeping resources?
(it can be replaced with a newly planted tree)	(e.g., reduce, reuse, recycle)	(You keep or hold on to them rather than use them up)
5ES.C.5	5ES.C.6	5ES.C.5
A student gives her outgrown jacket to her younger sister. Identify the type of conservation she used?  (reusing)	Name <b>TWO</b> renewable resources.  (e.g., air, water, trees, open space)	Describe the process for recycling a glass jar?  (by melting it and making a new jar)
	why are these fuels considered nonrenewable resources?  (Fossil fuels cannot be replaced and their supply is limited)  5ES.C.5  List TWO energy sources that fossil fuels provide.  (heat energy and electricity)  5ES.C.6  Why is a tree considered a renewable resource?  (it can be replaced with a newly planted tree)  5ES.C.5  A student gives her outgrown jacket to her younger sister. Identify the type of conservation she used?	Although fossil fuels are still forming, why are these fuels considered nonrenewable resources?  (Fossil fuels cannot be replaced and their supply is limited)  5ES.C.5  List TWO energy sources that fossil fuels provide.  (heat energy and electricity)  5ES.C.6  Why is a tree considered a renewable resource?  (it can be replaced with a newly planted tree)  5ES.C.5  A student gives her outgrown jacket to her younger sister. Identify the type of conservation she used?  2.8% of Earth's water is freshwater.  Where do we find most of this water?  (ice caps and glaciers)  5ES.C.5  Many people throw out almost five pounds of trash each day. How could everyone decrease the amount of trash thrown away daily?  (recycle materials)  5ES.C.5  List TWO ways to extend our supply of nonrenewable resources?  (e.g., reduce, reuse, recycle)

			Grade 5 - Renew & Reuse
į	5ES.C.5	5ES.C.6	5ES.C.5
\$300	Name <b>THREE</b> ways people can extend the use of non-renewable resources.  (reduce, reuse, recycle)	List <b>THREE</b> renewable resources.  (e.g., water, air, wildlife, trees)	List <b>THREE</b> non-renewable resources.  (e.g., FOSSIL FUELS (coal, oil, natural gas), METALS (copper, iron ore, gold)
į	5ES.C.5	5ES.C.6	5ES.C.5
(C)	When we recycle newspapers we are extending the use of the trees from which the paper was made. How is this similar to the recycling of aluminum cans?  (the lifetime of the world's supply of aluminum is also extended by recycling)	List <b>THREE</b> human actions that can help conserve a renewable resource.  (replanting trees in deforested areas, composting, recycling paper/aluminum)	Identify <b>THREE</b> effects of reusing items instead of throwing them out?  (e.g., saving resources, reducing pollution, saving space in landfills)
300	True or False?  A student knows that fossil fuels are formed from the remains of dead plants and animals. She believes we can easily create more fossil fuels. Explain why this true or false?  (False- the process takes millions of	Explain the meaning of recycling.  (Recycling means making something old into something new)	Identify the meaning of this symbol.  (Reduce, Reuse, Recycle)
	years)		

			Grade 5 - Renew & Reuse
	5ES.C.6	5ES.C.6	5ES.C.5
\$400	Many scientists are working on ways to gather the Sun's energy and use it for heat, electricity, and power. Although using solar energy has a lot of potential, there are also problems. What is one problem with solar energy?  (The energy from the sun can't be captured at night or under certain weather conditions)	Where is most of Earth's <b>available</b> fresh water found?  (groundwater – most fresh water in glaciers & ice caps, but that water is not readily available)	Metals, such as aluminum, iron, nickel, and copper, are all nonrenewable resources. Draw a conclusion about why it is important for metals to be reused and recycled.  (Nonrenewable means that once the resource the resource is used up, it's gone. If we do not reuse and recycle metals, we will not have any metals left to use)
	5ES.C.6	5ES.C.6	5ES.C.5
\$400	How are renewable resources different from nonrenewable resources?  (Renewable resources can be replaced more easily than nonrenewable ones)	Solar, biomass, geothermal, wind, and hydropower energy are all renewable sources of energy. Why are they considered renewable?  (They can be replenished by nature in a short period of time)	Coal, petroleum, natural gas, and propane are fossil fuels. How were fossil fuels formed?  (They were formed from the buried remains of plants and tiny animals that lived hundred of millions of years ago)
	5ES.C.5	5ES.C.5	5ES.C.5
\$400	Where does the energy in fossil fuels come from?  (The energy comes from the chemical energy of the organisms they were formed from)	Explain how you can reduce, reuse, and recycle to avoid wasting plastic shopping bags.  (Reduce your usage by using a cloth bag. Reuse the plastic bags as lunch bags. Recycle by putting them in bins with other bags or plastics that will be recycled)	List <b>FOUR</b> specific things you could do to reduce the amount of solid waste in a garbage can?  (e.g., <b>Recycle</b> any products – metal, glass, paper, plastic; <b>Reuse</b> items such as water bottles, plastic bags)