

8TH GRADE YEAR END REVIEW**FORMS OF ENERGY UNIT**

Fill in the chart below about forms of energy.

| Energy Form | Examples (2+) | Kinetic or Potential? |
|-----------------|--|-----------------------|
| Mechanical | <i>The energy of moving objects; running, tornadoes, sound</i> | <i>K</i> |
| Heat | <i>The energy of moving molecules; lava, boiling water, ice cube</i> | <i>K</i> |
| Electrical | <i>The energy of moving electrons; lightning, static electricity</i> | <i>K</i> |
| Electromagnetic | <i>Light energy; x-rays, infrared, radio waves</i> | <i>K</i> |
| Chemical | <i>The energy the bonds atoms together; firewood, food, fuel, all matter</i> | <i>P</i> |
| Nuclear | <i>The energy that holds a nucleus together; nuclear power, nuclear bombs, the sun</i> | <i>P</i> |
| Elastic | <i>The energy stored in an object when its shape is changed; a spring, a rubber band, a trampoline</i> | <i>P</i> |
| Gravitational | <i>The energy stored in an object above the ground; a skydiver, any object up high</i> | <i>p</i> |

1. What is the difference between kinetic and potential energy?

Kinetic energy is energy in action, potential energy is store energy that CAN do something later

2. Where does a ball have more potential energy—at 10 m high or 2 m high?

10 m, it is higher and will build up more speed

3. Which would have more potential energy—a 5 kg rock or a 10 kg rock?

10 kg, it is heavier and will hit harder (with more energy)

4. What is the Law of Conservation of Energy?

Energy cannot be created or destroyed, it can only change.

5. Identify which form of energy is being converted to which in the following:

a. Solar panels

from *electromagnetic to electrical*

b. A ceiling fan

from *electrical to mechanical*

c. Battery

from *chemical to electrical*

d. Stereo speaker

from *electrical to mechanical*

e. Windmill

from *mechanical to electrical*

f. Digesting food

from *chemical to mechanical*

g. A campfire

from *chemical to heat/electromagnetic*

6. Which type of energy do your ears sense? Your eyes?

7. Which type of energy is associated with the following tools?

a. Seismograph

mechanical

b. Eyeglasses

electromagnetic

c. Telescopes

electromagnetic

d. Hearing aids

mechanical

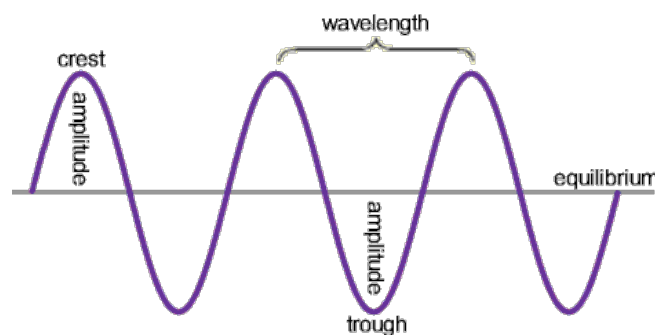
8. What are the two main types of waves?

Mechanical and electromagnetic

9. Which waves do not require a medium? What is a medium?

Electromagnetic, a medium is a substance that a wave travels through

10. Draw a wave and label the following: crest, trough, wavelength, and amplitude



11. What is frequency? What happens to wavelength when frequency increases?

Frequency is the number of waves per second, wavelength gets smaller as frequency increases

12. Name three things you can change about a wave to increase its energy.

Increase the frequency, increase the amplitude, decrease the wavelength

13. How do you separate white light into colors? What is this process called?

Use a prism, this is called refraction

14. Which kind of energy is sound? *mechanical*

15. What is heat? Does a cold object still have heat? Explain why or why not.

Heat is the motion of molecules/atoms. Cold objects still have heat because their molecules are moving

16. Fill in the chart below using your notes.

| Type of heat transfer | Explain it | Give examples |
|-----------------------|--|---|
| Conduction | <i>Transfer of heat between two touching objects</i> | <i>Touching a hot stove, holding an ice cube in your hand</i> |
| Convection | <i>Transfer of heat as liquids or gases rise</i> | <i>Steam, a hot air balloon</i> |
| Radiation | <i>Transfer of heat by infrared waves</i> | <i>The sun, heat lamps, a toaster</i> |

17. Identify if the following examples show conduction (CD), convection (CV), or radiation (R)

CD Pot on a stove

CV Hot air balloon

R Sun tanning

R Sitting around a fire

CV Using a hair dryer

CD Melting an ice cube in a glass of water

ENERGY INSIDE EARTH UNIT

1. Earthquakes change energy from which form to which? *Heat to mechanical*

2. What is the difference between a fault and a fold?

Folds are a bend in the Earth's crust, a fault is a break in the Earth's crust

3. What instrument do scientists use to measure the strength of an earthquake? *Seismograph*

4. Name three ways that earthquakes change the earth's surface over time.

Create mountains, move continents, create faults and folds

5. Which form of energy does magma bring to the earth's surface? *heat*

6. Name three ways that you can think of that volcanoes change the surface of the Earth.

Create new rocks, create islands, make mountains, cover the landscape with ash

7. Which one of the three types of rock do volcanoes make? *Igneous*

8. Name the 4 characteristics that make a mineral a mineral.

Natural, non-living, solid crystal, chemical formula

9. What determines the size of mineral crystals?

Fast cooling = small, slow cooling = big

10. What are the 8 properties used to distinguish one mineral from another?

Color, streak, luster, density, hardness, crystal system, cleavage/fracture, special properties

11. What is Mohs Scale of Hardness? How do you use it?

Scale of 1-10 with 10 being the hardest, you use it by figuring out what can scratch a mineral. Example: if a fingernail scratches it, the mineral is a 1 or 2

12. What two terms are used to describe how a mineral breaks?

Cleavage = clean break, fracture = a break with no pattern

| Rock Type | How it forms | Visual characteristics used to identify it |
|-------------|---|--|
| Igneous | <i>Cooling of magma or lava</i> | <i>Holes, glassy, black, has mineral speckles</i> |
| Sedimentary | <i>Sediments of old rocks are compacted together</i> | <i>Gritty, small particles, fossils, straight layers</i> |
| Metamorphic | <i>Rocks are exposed to heat and pressure deep in the Earth</i> | <i>Swirls, streaks, flakey layers, metallic appearance</i> |

13. What is a rock?

A mixture of minerals

Identify what would need to happen for the following changes to occur.

14. Metamorphic to lava

Melting

16. Metamorphic to sedimentary

Weathering, sediments, compaction

18. Igneous to metamorphic

Heat and pressure

15. Sedimentary to metamorphic

Heat and pressure

17. Lava to igneous

Cooling and hardening

ENERGY AND EARTH'S SURFACE UNIT

1. What is weathering? *The breaking down of rocks*

2. What is the difference between mechanical and chemical weathering?

Chemical weathering involves chemical reactions, mechanical weathering does not

3. Give 2 examples of mechanical weathering and 2 examples of chemical weathering.

M- *temperature change, abrasion*

C- *Acid rain, oxidation*

4. Which gas in the atmosphere is responsible for rusting/oxidation? *Oxygen*

5. What is the connection between weathering and soil?

Weathering breaks down rocks to make soil

6. What is erosion? *The moving of sediments from one place to another*

7. What is deposition? *When sediments settle in a new place*

8. What are the 5 things that cause erosion and deposition (3 W's and 2 G's)?

Wind, (running) water, waves, gravity, glaciers

9. Give any 3 examples of how erosion and deposition can change the Earth's surface. (Think landforms)

Make valleys, caves, causes landslides, makes beaches

10. Give any two examples of how gravity can affect the Earth's surface.

Causes landslides, rockslides, slumps and creep

11. What is the law of superposition? *Oldest layers should be on the bottom, youngest should be on top*

12. Name 3 things that can change the order of rock layers.

Erosion, volcanic activity, earthquakes

13. Explain how index fossils can help determine the age of a rock layer.

Index fossils are a short lived species, so when you find them, you know the rock came from a specific period of time

14. What is a fossil? *Preserved evidence or remains of a living thing*

15. Name at least three ways that a fossil can form.

Mineralization, molds/casts, imprints, preservation of the organism

16. In which one of the three main types of rock are fossils found?

Sedimentary

17. Name three things fossils can help us know about the past.

How environments have changed, how species have developed, what was once on Earth

18. **Underline** the processes below that are gradual changes and **circle** the processes that are abrupt changes.

Mountain Building

Volcanoes

Erosion

Deposition

Weathering

Earthquakes

CHEMICAL ENERGY UNIT

1. What are physical properties?

Properties that can be observed or measured without creating a new substance

2. What is a chemical property?

Properties that can ONLY be measured through the creation of a new substance.

3. For each of the following examples, identify if it is a chemical property (C) or a physical property (P).

C Reacts with water

P Melts at room temperature

C Flammable

C Nonflammable

P Hard

P Soft

C Does not react with water

P Evaporates at room temperature

4. What makes a chemical change different from a physical one? *Makes a new substance*

5. How can you tell if a chemical reaction (or chemical change) has occurred? Name 3 signs.

Energy is taken or released, gas is produced, strange color change, change in smell or taste

6. For each of the following examples, identify if it is a chemical or a physical change.

C/P Color change

C Change in size

C Light is given off

P Change in shape

C Change in odor

P Change in phase

P Heat is given off

C Gas is given off

7. What is the difference between a reactant and a product?

A reactant is a substance at the beginning of a reaction, a product is a substance created by a reaction

8. Name two types of energy that can come out of a chemical reaction.

Heat, light, mechanical, even electrical (battery)

9. What five things can you change in order to speed up or slow down a reaction?

Temperature, concentration, surface area, stirring, catalyst

10. What is concentration? *How much chemical is in a certain volume, or how "strong" the chemical is*

11. Does crushing something increase or decrease its surface area? *Increase*

12. What 2 things happen to atoms when they are heated? *Speed up and spread out*

13. Describe or draw the arrangement and movement of the particles in each of the 3 states of matter:

Solid: *Close and slowly vibrating* Liquid: *Further apart and flowing* Gas: *Far apart and fast!*

14. What causes substances to change from one state to another?

A change in heat energy

15. What is going from solid to a liquid called? Liquid to solid?

Melting

Freezing

16. What is going from a liquid to a gas called? Gas to liquid?

Vaporization (boiling, evaporating)

Condensation

17. Name two phase changes that are an increase in energy and two that are a decrease in energy.

Increase = melting/boiling

Decrease = Freezing/condensation

18. What happens to the temperature during an actual phase change?

It doesn't change, all the energy is used to change the phase of the substance

19. What is the Law of Conservation of Mass?

Matter is not created or destroyed in chemical reactions, it is just rearranged

20. What substance in the air causes metal to rust and rocks to turn orange/red?

Oxygen

21. What 3 things need to be present for a fire to burn? *Oxygen, fuel, heat*

BIOLOGICAL ENERGY UNIT

1. How do producers obtain energy? Give examples of producers.

By doing photosynthesis to make their own food. Plants, algae

2. How do consumers obtain energy? Give examples of consumers.

By eating other organisms. Carnivores, omnivores, herbivores

3. How do decomposers obtain energy? Give examples of decomposers.

By breaking down dead/decaying organisms. Bacteria, mushrooms, mold

4. What is the purpose of respiration?

To release the potential chemical energy stored in food.

5. What is the equation for cellular respiration?



6. What are the names of the reactants? What are the names of the products?

Sugar (glucose) and oxygen Carbon dioxide, water and Energy

7. Energy is converted in cellular respiration from which form to which?

From chemical to mechanical and heat

8. What is the source of all biological energy?

The sun

9. What is the equation for photosynthesis?



10. What are the reactants that make photosynthesis happen? What are the products?

Carbon dioxide, water and sunlight oxygen and sugar

11. Where in a plant cell does photosynthesis take place?

The chloroplast

12. Why do plants need chlorophyll?

It traps the sunlight necessary for doing photosynthesis

13. Energy is converted through photosynthesis from which energy form to which?

From electromagnetic to chemical

14. Do plants still need to do cellular respiration? Why or why not?

Yes, photosynthesis only MAKES the food for them, cellular respiration gets the energy from food

15. Write an example of a food chain that would be found in a meadow or forest.

Grass → mouse → fox → coyote

16. Which way do the arrows point in a food chain/web?

Always to the eater or where the energy is going

17. What is the difference between predators and prey?

Predators eat the prey

18. Define and give an example of commensalism.

A relationship in which one species benefits and the other is not affected. Barnacles growing on whales.

19. Define and give an example of mutualism.

A relationship in which both species benefit from each other. Bees and flowers.

20. Define and give an example of parasitism.

A relationship in which one species benefits and harms the other. Leeches feeding on mammals.

21. Fill in the chart below concerning human impacts on the environment.

| Human Impact | What it is | Ways it Happens |
|--------------|--------------------------|---|
| H | <i>Habitat loss</i> | <i>Deforestation, draining of wetlands</i> |
| I | <i>Invasive Species</i> | <i>People releasing pets, stowaways</i> |
| P | <i>Pollution</i> | <i>Acid rain, pollution from cars/factories, litter</i> |
| P | <i>Population growth</i> | <i>Urban sprawl</i> |
| O | <i>Overharvesting</i> | <i>Overfishing, poaching</i> |

22. How is extinction today different than in the past?

Extinction today is mostly caused by humans and we take things out of the ecosystem while they are still important.

ENERGY AND FORCES UNIT

1. What is a force?

A push or a pull on an object

2. What is friction?

A force that opposes the motion of any object

3. Name the four types of friction and give an example of each.

Static friction: parking on a hill

Sliding Friction: rubbing your hands together

Rolling friction: a skateboard

Fluid friction: a parachute

4. What is the specific name for the type of friction that air generates?

Drag

5. What is gravity?

A force that pulls one piece of matter towards another

6. What causes some things to fall faster than others? **Explain.**

Air resistance slows some things down more than others.

7. What is mass?

The amount of matter in an object

8. What is weight?

The amount of force that gravity pulls on you

9. What are the two things that affect the strength of gravity?

Distance from the object, mass of the object

10. What is work?

Using a force to move an object a certain distance

11. How do you calculate the amount of work done?

Force x Distance

12. What is a machine?

An object that makes work easier by changing the amount of force or the direction of the force

13. What are the 6 types of simple machines? Give an example of each.

Inclined plane: Moving ramp

Lever: Crowbar

Wedge: an ax

Wheel: gears

Screw: bottle top

Pulley: a crane

14. How do you calculate the mechanical advantage of a machine?

Resistance FORCE/ Effort FORCE or Output FORCE/Input FORCE

15. What are the specific formulas for calculating mechanical advantage of a lever and inclined plane?

Lever:

Inclined plane:

Effort Arm LENGTH/ Resistance Arm LENGTH

Length/Height

16. What is a complex/compound machine?

A combination of simple machines

17. How do machines affect the amount of work done in a situation (be very careful)?

They don't change the amount of work, they just make it easier to do

18. How do you make a lever better?

You make the effort side (the side you push on) as long as possible

19. How do you make an inclined plane better?

Make the ramp as long as possible