

Science in the Elementary and Middle School Years Checklist:

This is a list of some of the science units and topics we'll cover in elementary and middle school. We will return to these topics more than once, each time going into more depth. We spend as much time as needed (and while interest lasts). I know we'll cover the topic again in a few years.

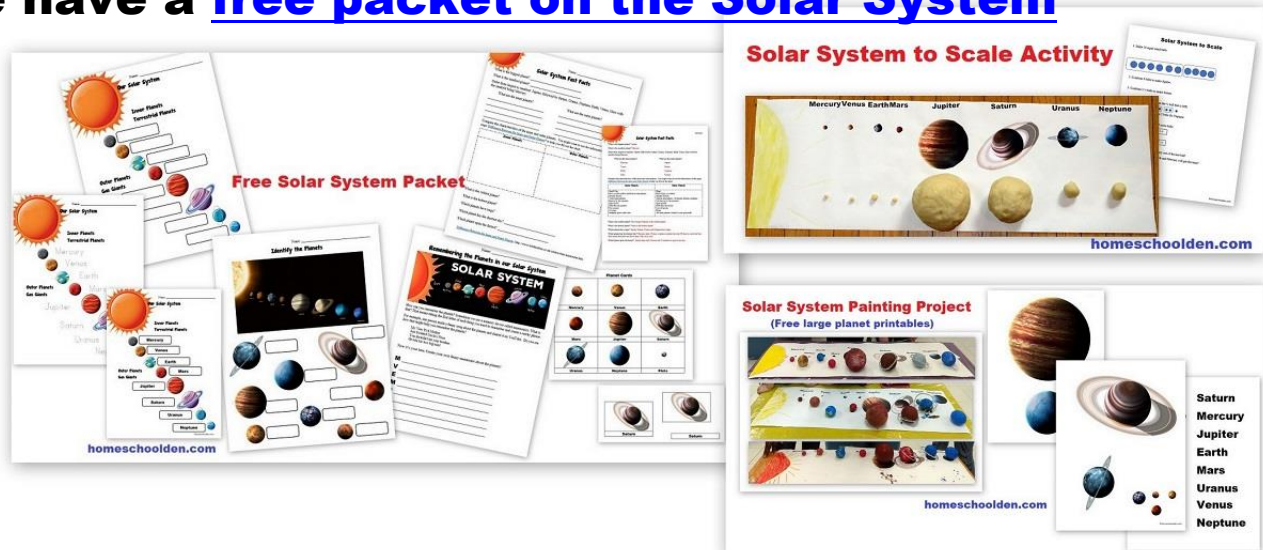
The Human Body	
	Cells
	Tissues
	Nervous System
	Skeletal, Muscular and Integumentary Systems (skin, etc.)
	Circulatory and Respiratory Systems
	Digestive and Excretory Systems
	Endocrine and Reproductive Systems
	Immune System and Disease
Biology	
	Plants and Animal Cells
	Cell structure and Process
	Cell Function (chemical reactions inside cells)
	Prokaryotes vs. Eukaryotes, Plant vs. Animal Cells
	Cell Division DNA-RNA, Genetics
	Life Cycle and Reproduction
	Plants
	Growth
	Photosynthesis
	Genetics
	Animals
	Unit on animal adaptations, animal habitats, animal homes, animal characteristics, migration, camouflage, animals and their young, vertebrates/invertebrates, herbivores/carnivores/omnivores, herbivores/carnivores, conservation - extinct vs. endangered animals, [This is a carryover from the science we covered in the preschool years (ages 4-6) ... and there is a separate checklist for that!]
	Animal anatomy and physiology
	Classification, taxonomy
	Kingdom, phylum, class, order, family, genus, species
	Offspring names
	Group names
	Levels of organization
	Biosphere, ecosystem (biome), community, population, organism, groups of cells, cells, molecules
	Microorganisms - bacteria, viruses, protists, fungi
	Biomes (ecosystems)
	Ocean Life
	Ecology - interdependence of organisms and their environment, food chain
	Population Dynamics
Chemistry	
	Atoms, Molecules
	States of Matter & Changes in the states of matter

	Physical and Chemical Properties of Matter
	Mixtures & Solutions
	Acids & Bases
	Atomic structure - periodic table
	Common elements, chemical bonds, chemical reactions
	Building molecules, Valence Electrons, Bohr diagrams, Lewis Diagrams
	Molecular Chains
Astronomy	
	Solar System Inner and outer planets, asteroid belt
	Moon
	Gravity
	Kinds of Stars
	Galaxies
Earth Science	
	Geology - history of the Earth
	inside Earth – geosphere
	Rocks & Minerals - sedimentary, metamorphic, igneous rocks
	Earth systems (geosphere, biosphere, hydrosphere, atmosphere)
	Atmosphere
	The Magnetosphere - Earth's Magnetic Field
	Earth's movement – changes to Earth's surface
	plate movement
	what changes landforms
	Faults – Waves what causes mountains, volcanoes, earthquakes
	how has Earth's surface changed
	Weather
	Water
	Freshwater
	Underground water
	Oceans, Tides, Currents – The Hydrosphere
	Cycles
	Water Cycle
	Oxygen Cycle
	Nutrient Cycle
	Nitrogen Cycle
	Carbon Cycle – (Coal, Oil, Gas)
	Sulfur Cycle
	Phosphorus Cycle
	Rock Cycle
	Environmental Studies: Trash & Recycling; Renewable and Nonrenewable Energy
Physics	
	Simple Machines
	Magnets, Magnetic Fields, the Magnetosphere
	Speed, force, energy, motion, power, heat, heat transfer, conduction, convection, radiation
	Light and optics
	Electricity
	Sound - vibration, waves, speed, frequency, wavelength, amplitude

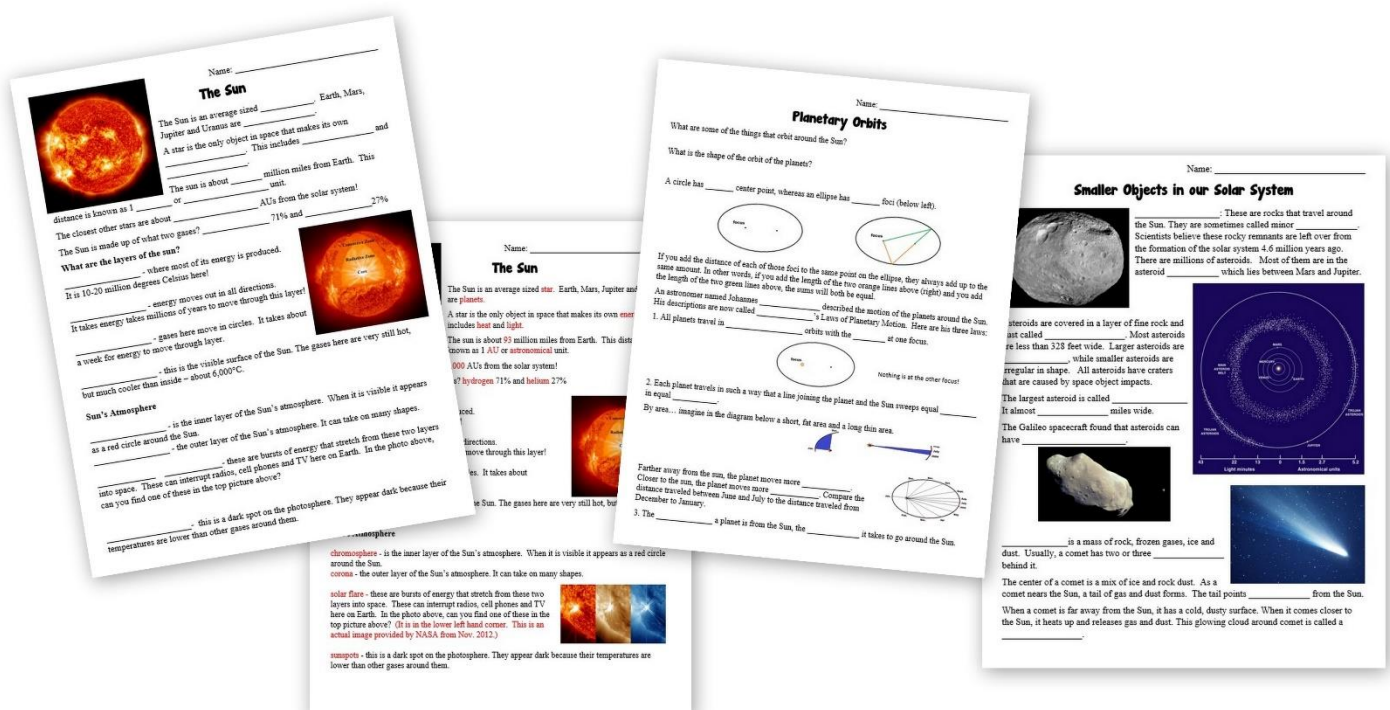
Our Packets – visit our store: HomeschoolDen.com/store

You might want to check out some of the packets we have available. They range in length from 30 to more than 150 pages and include notebook pages, worksheets, interactive notebook activities, hands-on activity ideas (with photographs) and more!

We have a [free packet on the Solar System](#)



Plus we have some free notebook pages on [Astronomy](#) for Middle School Students as well.



You might also be interested in these packets:

Earth Science Packet (150 pages)



**Layers of the Earth
Interactive Notebook
Pages**

**Types of Volcanoes
Interactive Notebook
Pages**

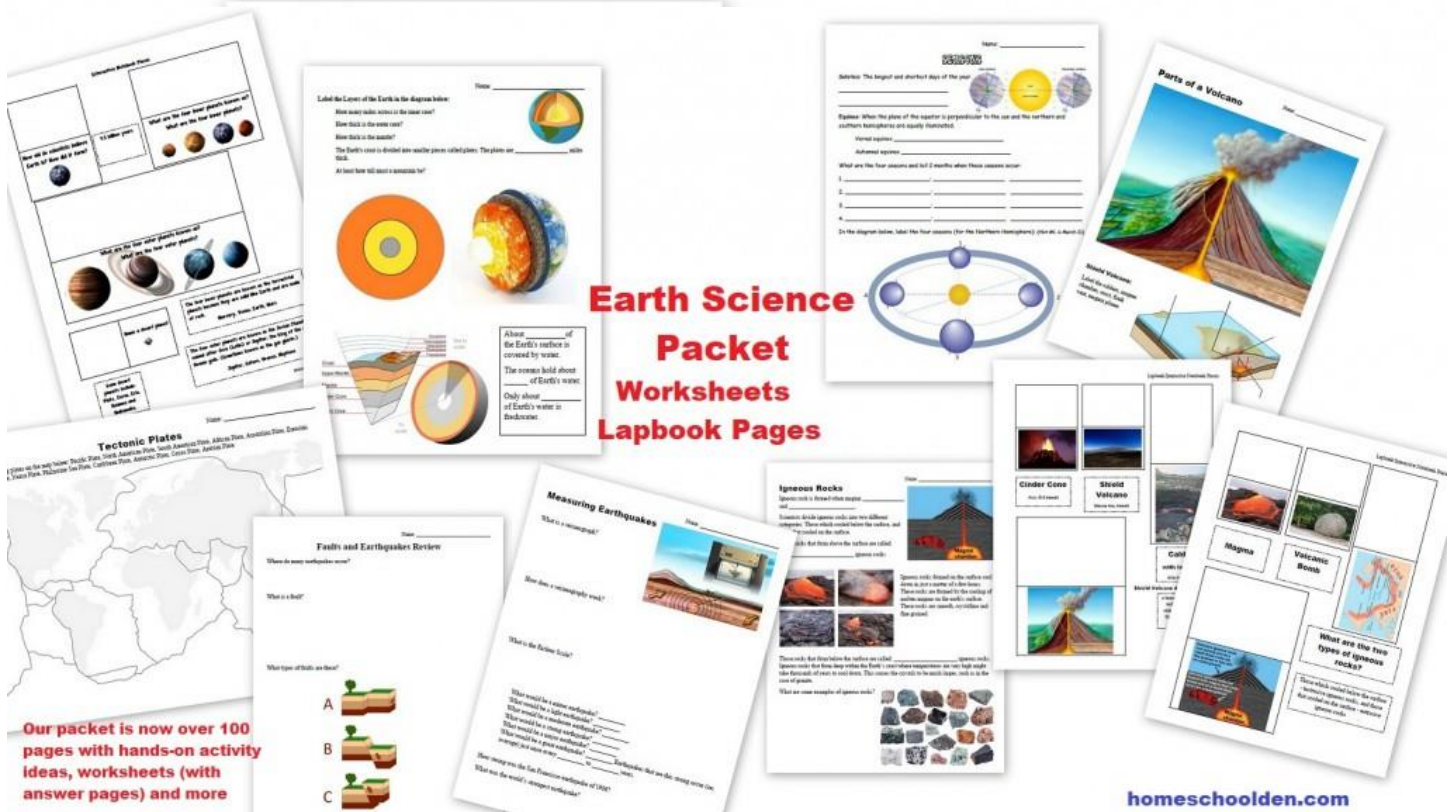


Earth Science Packet (more pictures of what's included...)

Layes of the Earth - Interactive Notebook Activity

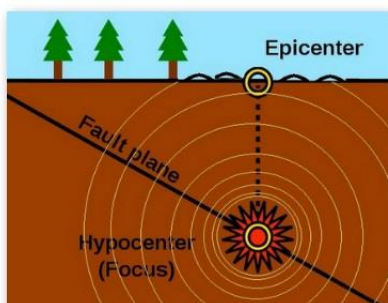


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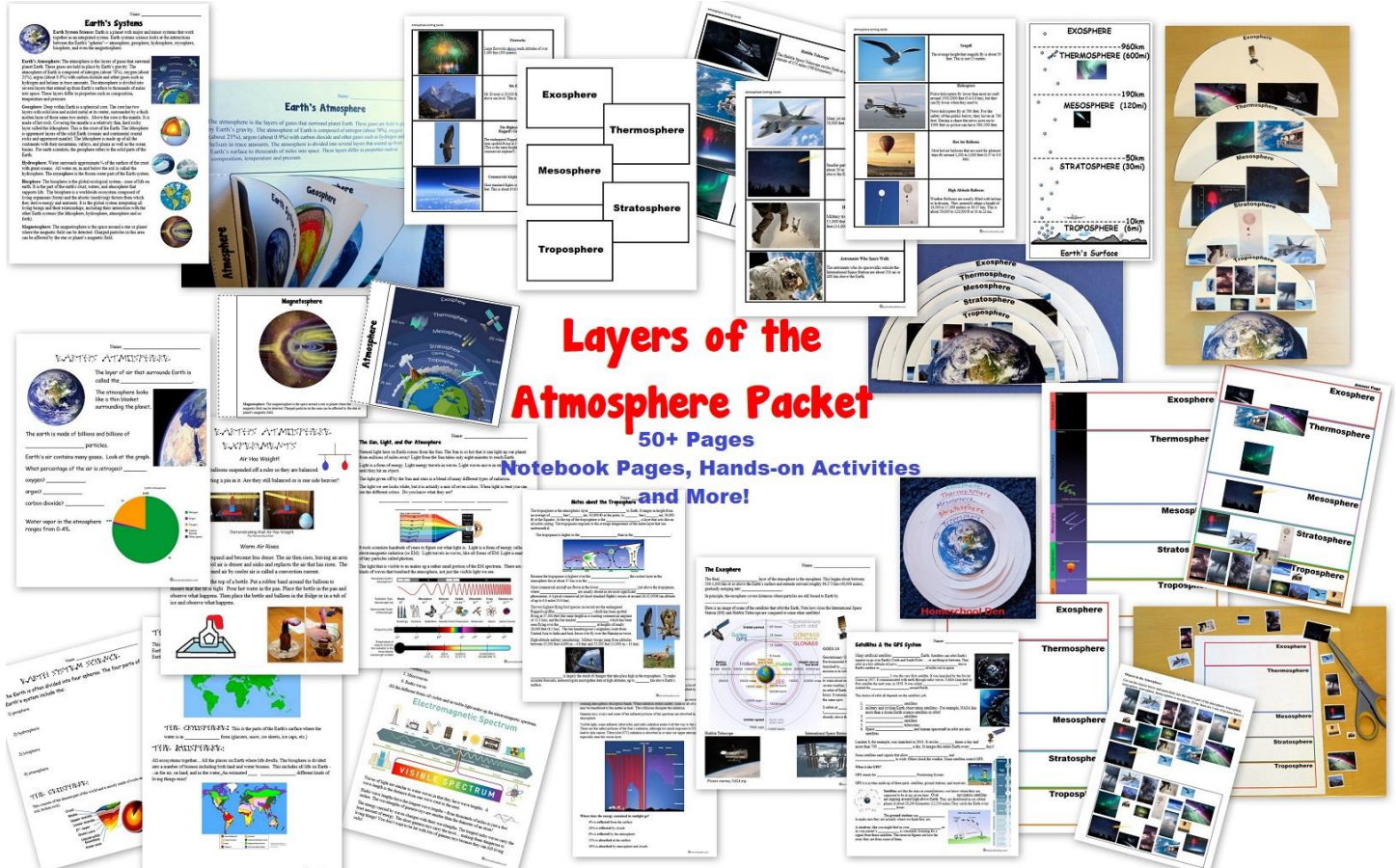
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Earth Science: Learning about Earthquake Vibrations



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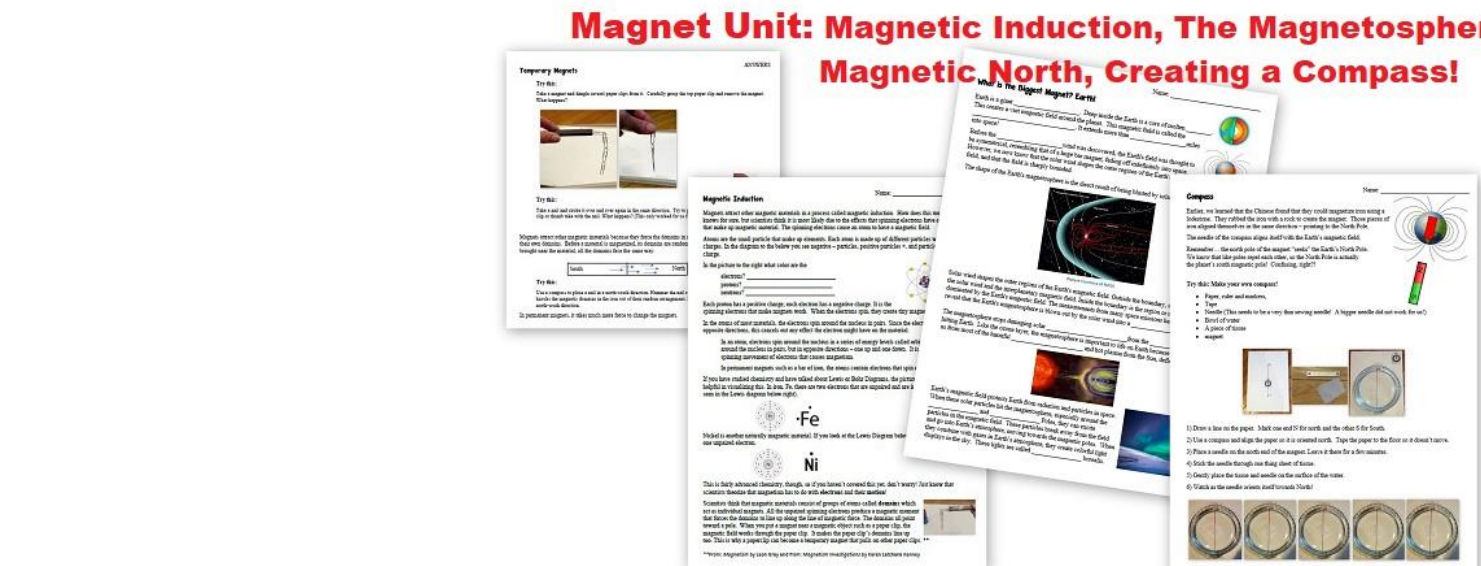
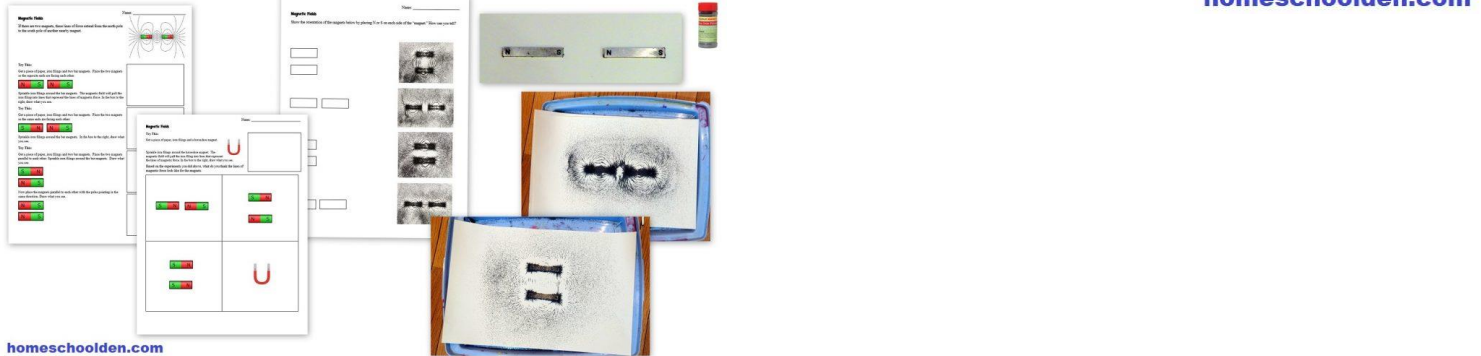
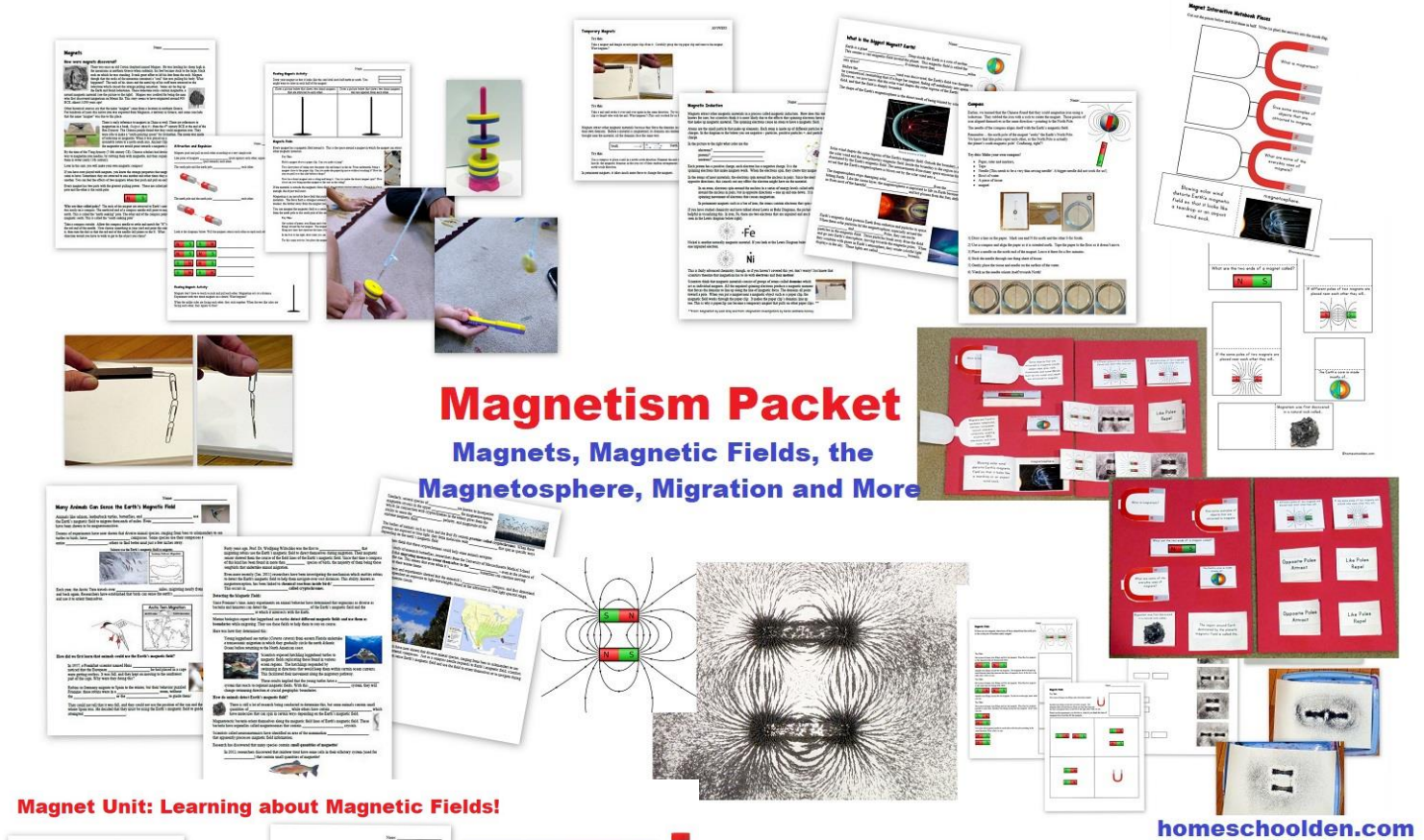
Layers of the Atmosphere Packet



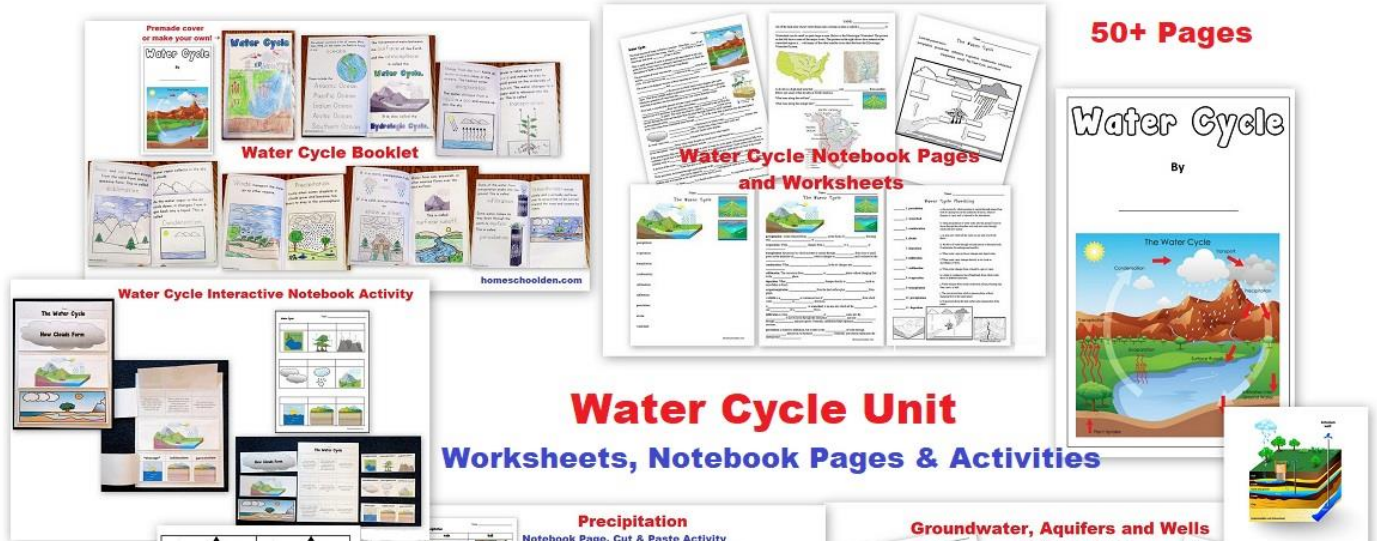
Earth's Atmosphere Packet, 50+ pages



Magnet Packet: Magnetic Fields, The Magnetosphere, and Animal Migration

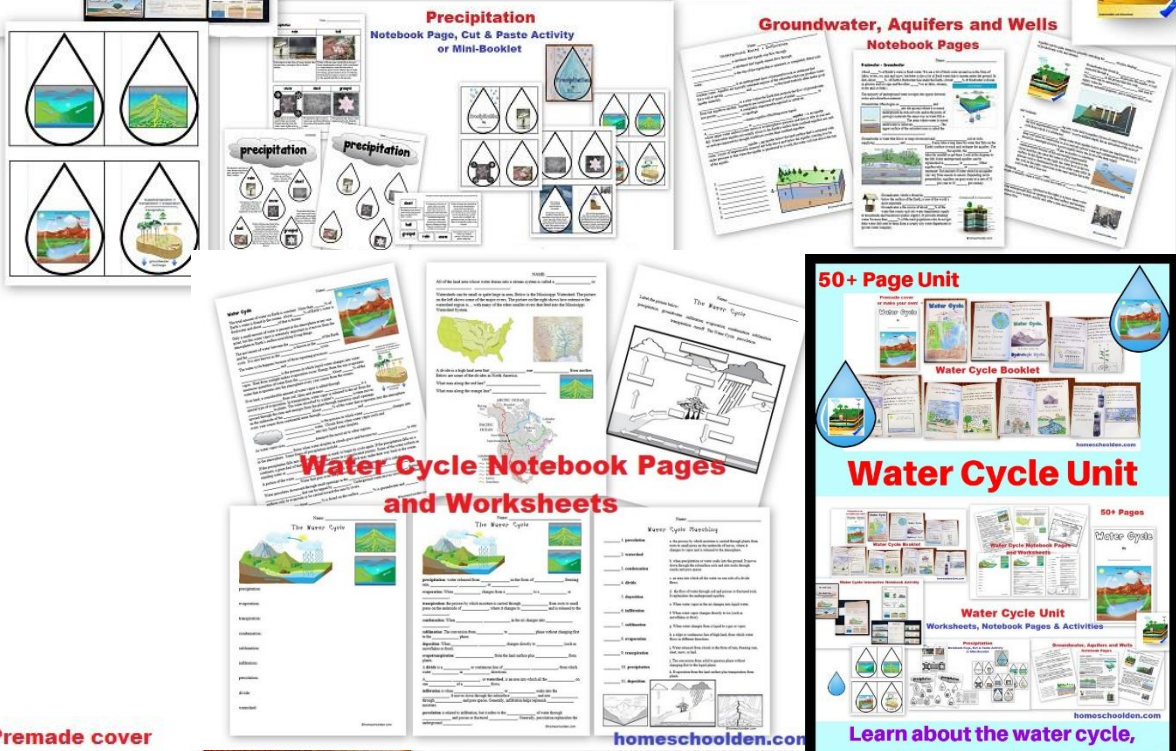


The Water Cycle

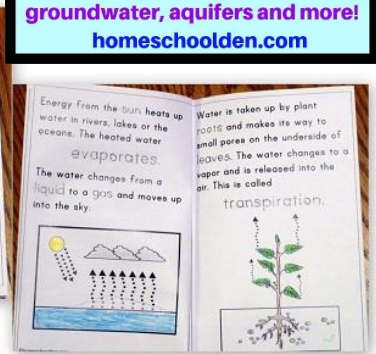
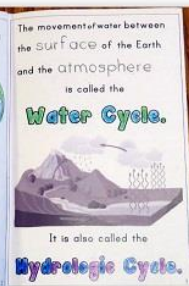
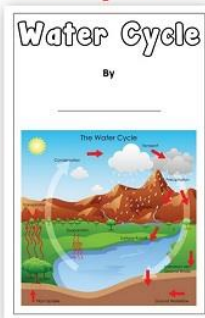


Water Cycle Unit

Worksheets, Notebook Pages & Activities



Premade cover
or make your own! →



Water Cycle Booklet



Environmental Studies: Trash and Recycling



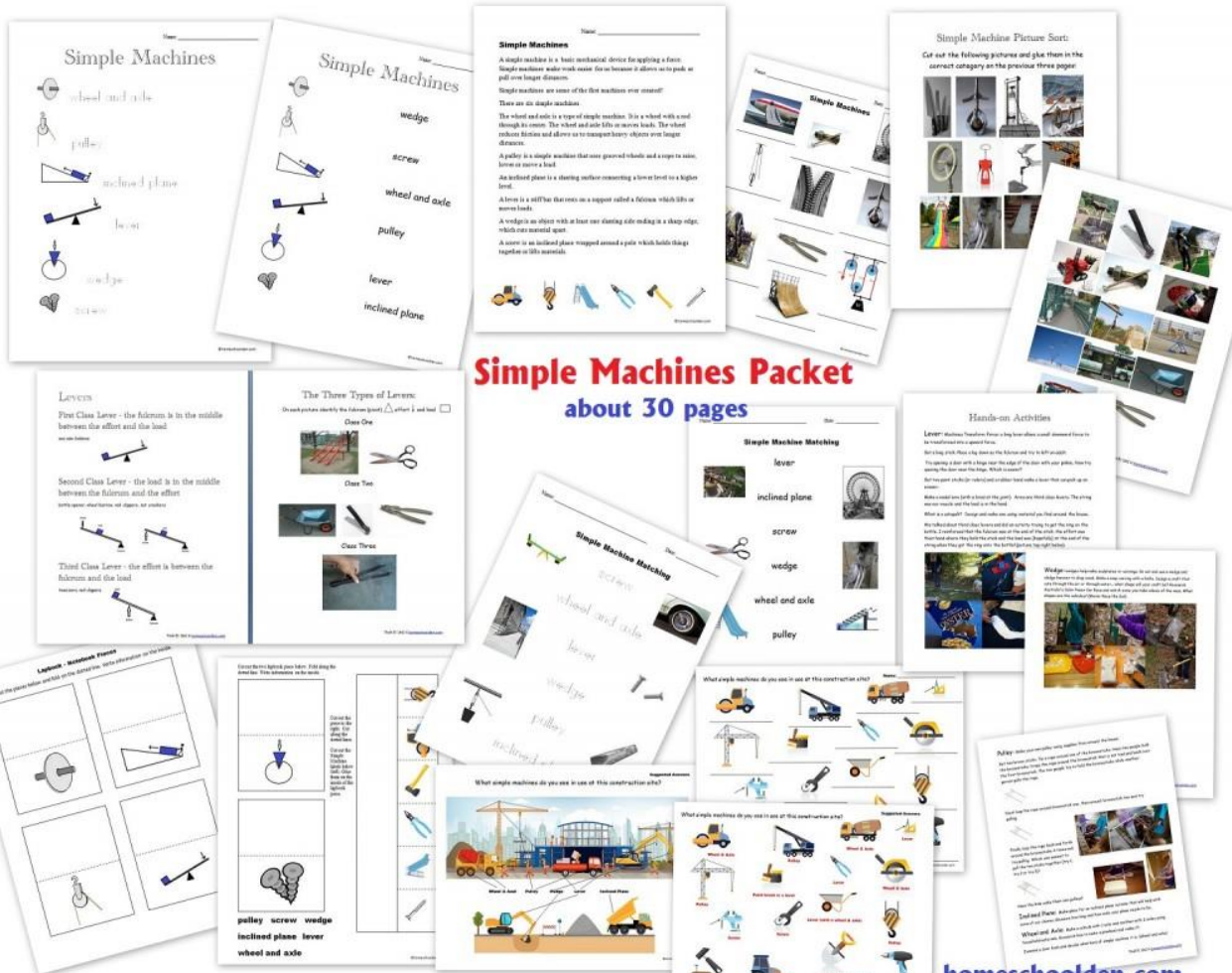
Trash & Recycling Booklet



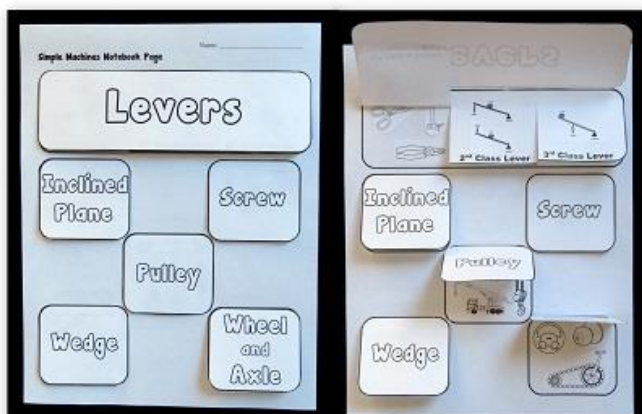
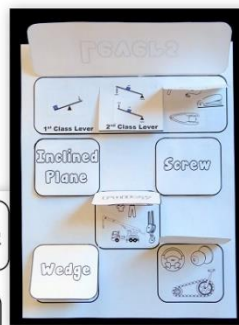
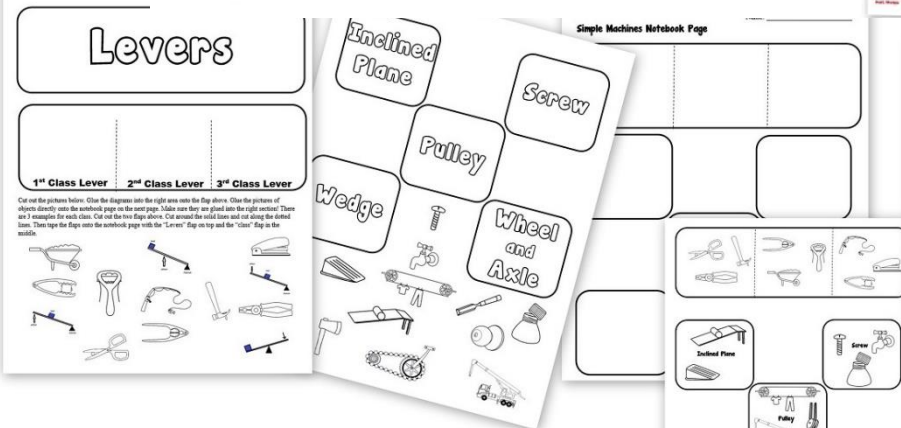
homeschoolden.com

Environmental Studies: The Carbon Cycle, Nonrenewable Energy (Coal, Oil, Gas) and Renewable Energy (Coming Soon!)

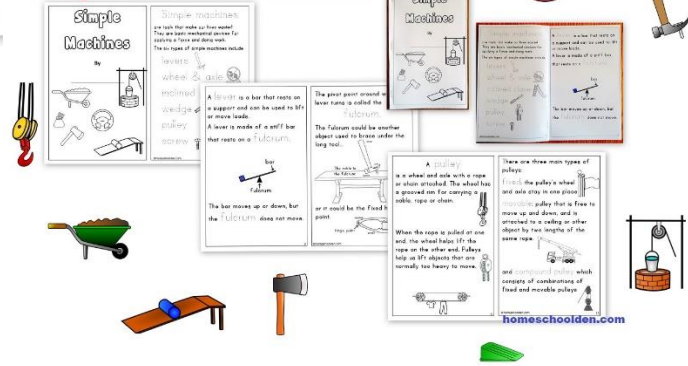
Simple Machines Packet (30+ pages)



homeschoolden.com

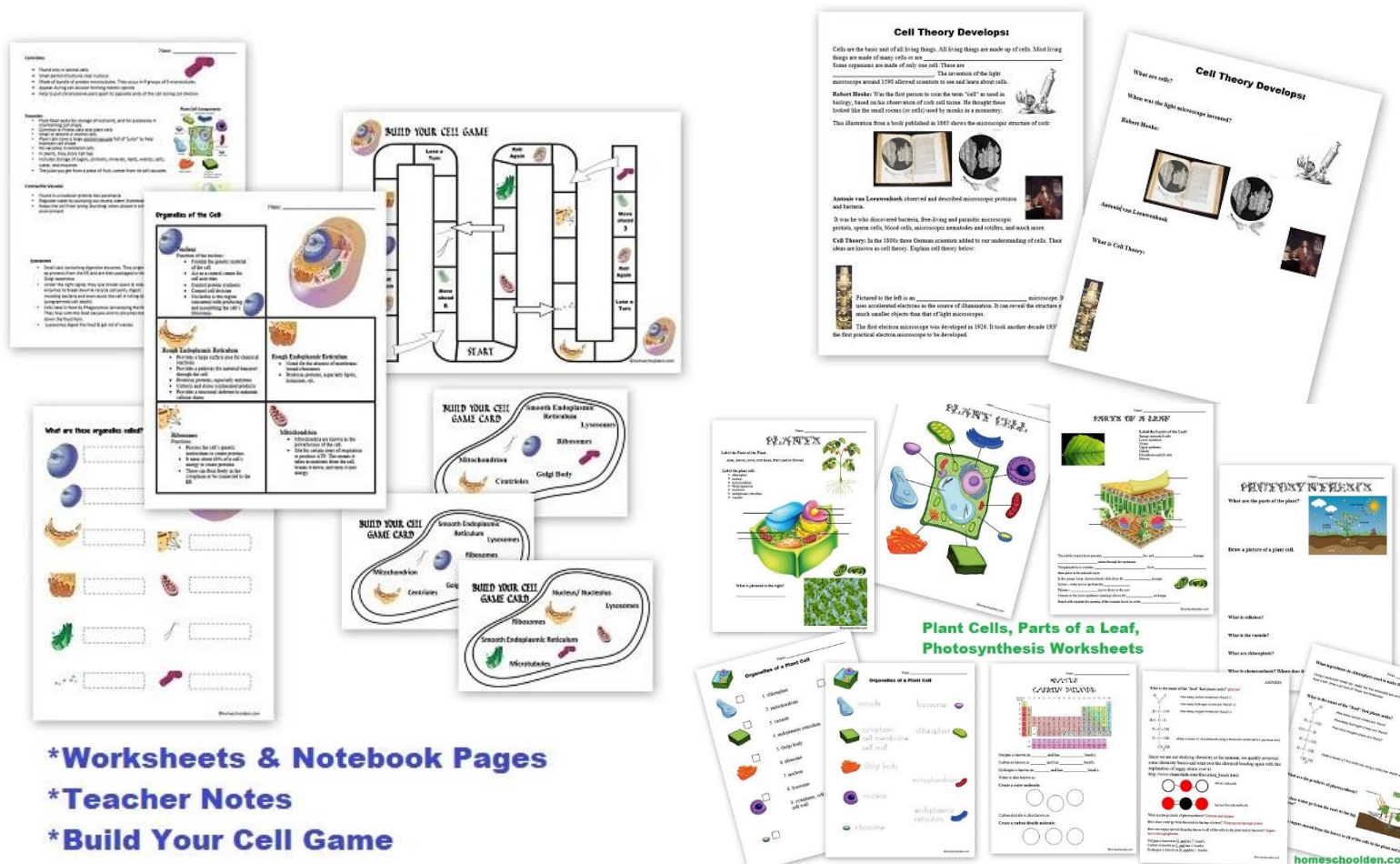
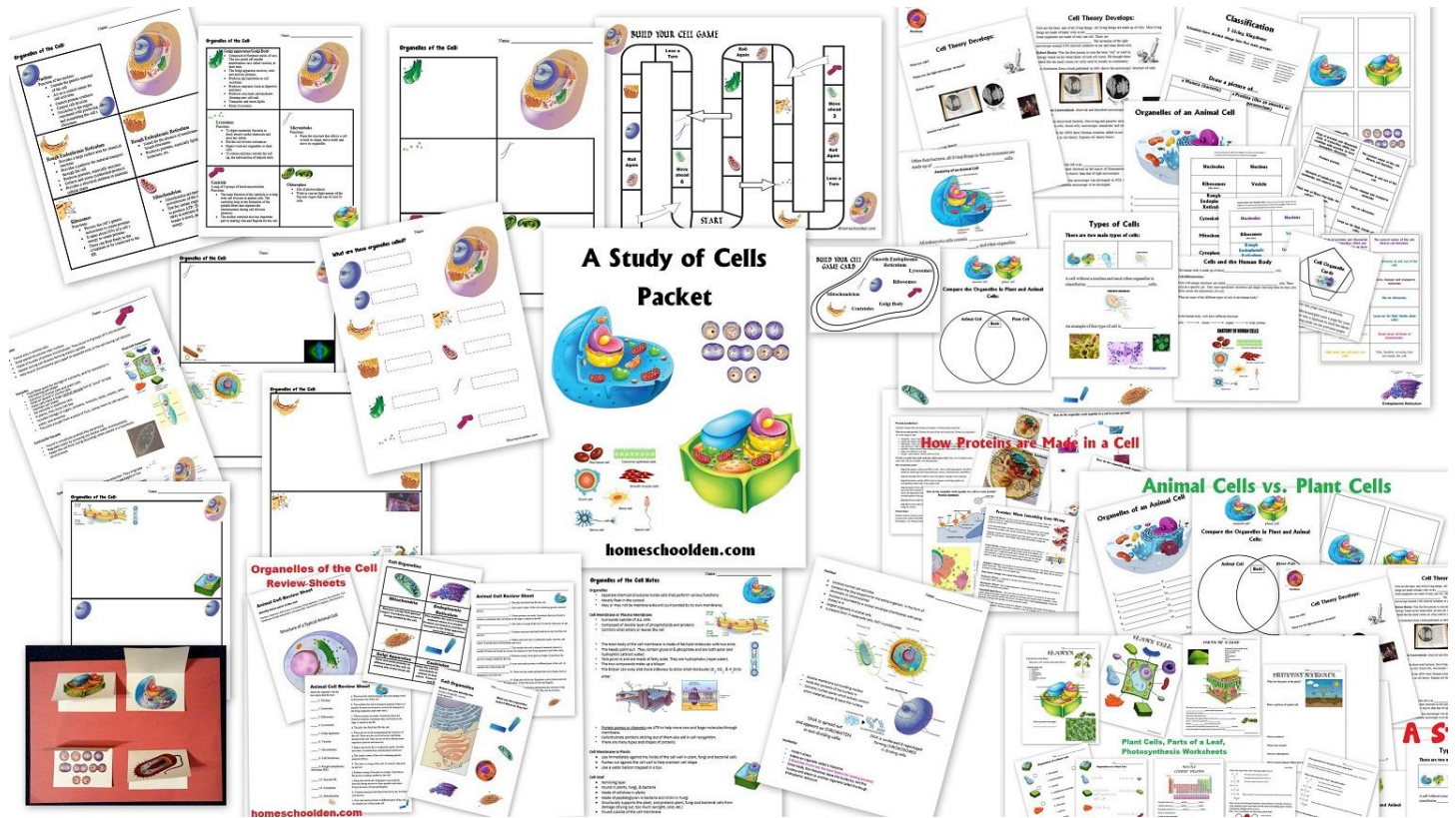


Simple Machines Booklet



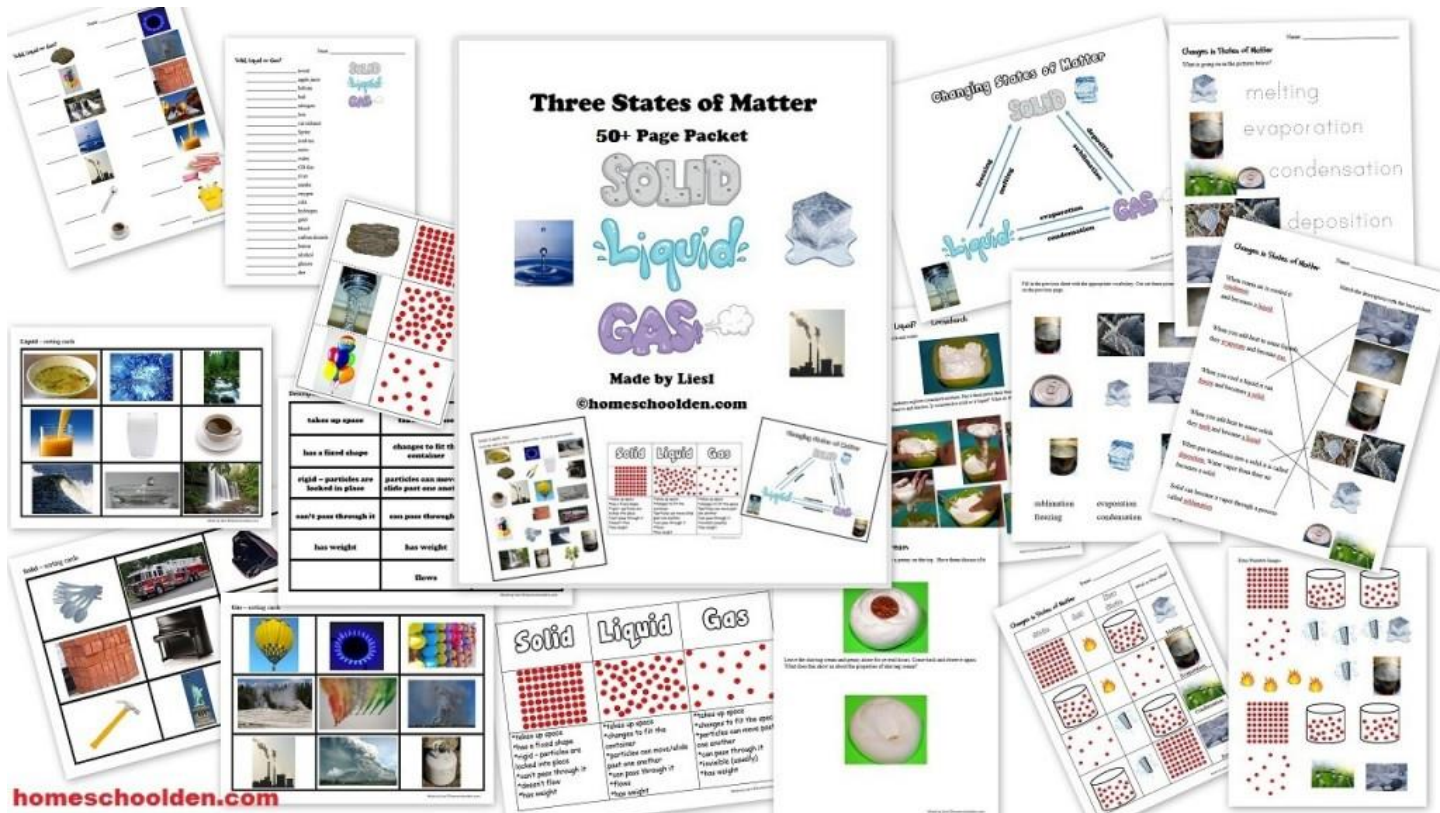
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A Study of Cells (100 pages)

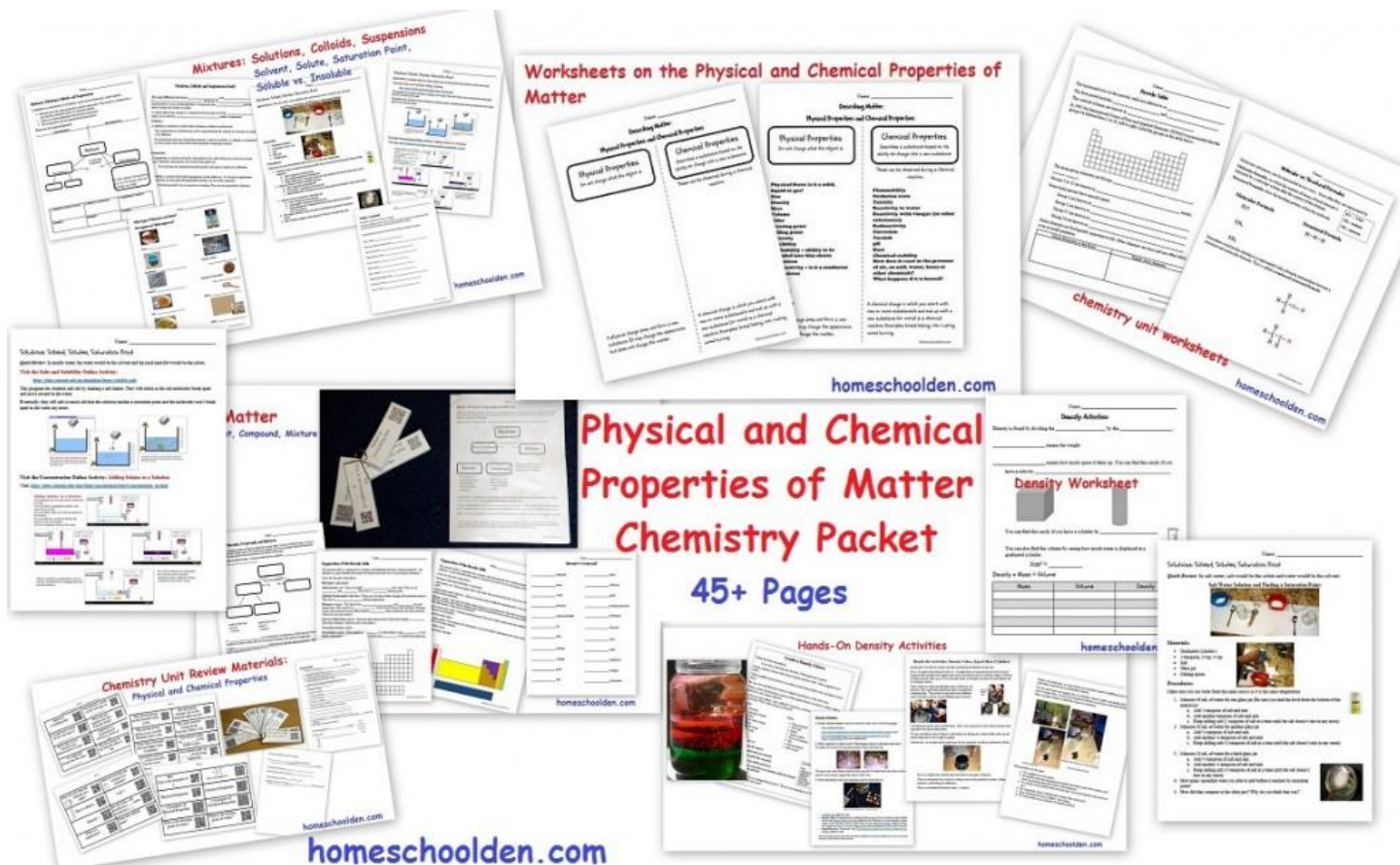


- *Worksheets & Notebook Pages
- *Teacher Notes
- *Build Your Cell Game

States of Matter



Physical and Chemical Properties of Matter



Chemistry Packet Learn about the periodic table, the elements & their groups, valence electrons, Bohr Diagrams, Lewis Diagrams and more!



Hands-On Chemistry Cards!

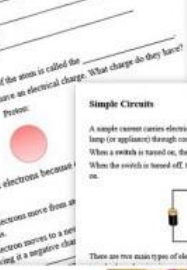


Electricity and Circuits Packet

Electricity and Circuits

Packet

Hands-On Activities




Parts of an Atom:
Atoms are the building blocks that make up...
Individual atoms have smaller particles. Label them below:

The part in the middle of the atom is called the...
Protons and electrons have an electrical charge. What charge do they have?

Electron: -

Protons attract electrons because...

Friction: Sometimes electrons move from one...
When an electron moves to a new...
...it leaves a negative charge.



Electric Current
Electric current is generated when... move from... to...
Conductors: Electric current flows through some materials more easily than others. Conductors have atoms that move freely and can have electrons easily. The most conductive material is... Most wiring and circuits use... as a conductor because it is not as expensive. What are some other examples of conductors?

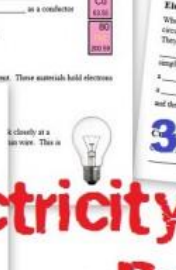
Insulators: Some substances resist the flow of electric current. These materials hold electrons in place.

Simple Circuits
A simple circuit carries electricity from the power source (battery or socket) to the lamp (or appliance) through conducting wires. When a switch is turned off, there is a gap in the circuit, so the light does not turn on.

There are two main types of electric circuits. They differ in the way the current...
In a series circuit, the flow of electric current may change, but it always...
In a parallel circuit, the current flows in... and then flows in the opposite... or "return" circuit.

Resistance
When you have a light bulb in a circuit, the current has to go through the bulb. The filament inside the bulb is made of a material that resists the flow of electricity. This resistance is what makes the bulb glow. The filament is made of a material that resists the flow of electricity. This resistance is what makes the bulb glow.

LED Lights:
LEDs are small, solid-state lights that are used in many electronic devices. They are made of a material that resists the flow of electricity. This resistance is what makes the LED glow.



Batteries
Batteries have a positive and negative side. Electrons flow from the... side of the battery to the... side. Electrons are negatively charged, and negative repels. The amount of force that the electrons flow with is measured in... How many volts do these batteries have?

AA battery: 1.5V
AAA battery: 1.5V
C battery: 1.5V
D battery: 1.5V

The higher the voltage, the more... will flow through the wire.

Electricity
When electricity flows, electrons move through the wire. Electrons flow from the negative side of the battery to the positive side. They move as fast as they can, but they are slowed down by the resistance of the wire. They move as fast as they can, but they are slowed down by the resistance of the wire.


single circuit has three parts: start and end at the same place, and the... that connects them.

30-Page
This packet contains 30 pages of hands-on activities for students to learn about electricity and circuits.


Electricity and Circuits

Packet

Hands-On Activities



Electricity and Circuits Packet
30-Page Packet
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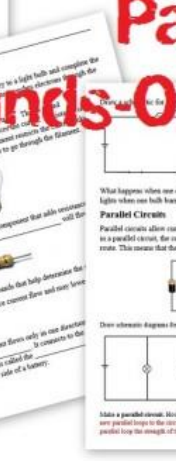


Open and Closed Circuits
An open circuit is an incomplete electrical path. We use... to open and close the circuit. Draw a schematic for an open circuit.

is a closed circuit?

At a simple circuit, Test and observe. Then add in another light. Test and observe. And add in a third. Test and observe. What happens?

A circuit has only one way for the current to go. Observe. And add in a third. Test and observe. What happens?



Circuit Maze
This maze is designed to help you understand how a circuit works. The maze is made of a material that resists the flow of electricity. This resistance is what makes the maze glow.

Draw a parallel circuit with a light and a motor.

The electrons in your house are divided into parallel circuits, providing a protective... of circuit breakers or fuses. This is done by several different means.

Students and...
Circuit breakers and...
Circuit breakers and...
Circuit breakers and...
Circuit breakers and...
Circuit breakers and...

Draw a schematic for a parallel circuit.

Parallel circuits allow current to flow along more than one path. If it is a parallel circuit, the current can still travel through the circuit even if one of the lights goes out.

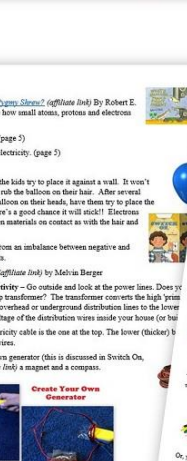
Draw a schematic for a parallel circuit.

Make a parallel circuit. How does a parallel circuit differ from a series circuit? In a parallel circuit, the current can flow through more than one path. In a series circuit, the current can only flow through one path.

Electricity and Circuits

Packet

Hands-On Activities



Day 1:
Read *What's Smaller Than a Pygmy Shrew?* (affiliate link) By Robert E. Wells to help kids really realize how small atoms, protons and electrons are.

Go over the parts of an atom. (page 5)
Talk about friction and static electricity. (page 5)

Hands-On Activity
Take a balloon and have the kids try to place it against a wall. It won't stick. Then have the kids rub the balloon on their hair. After several minutes of rubbing the balloon on their hair, have them try to place the balloon on the wall. There's a good chance it will stick! Electrons can be exchanged between materials on contact as with the hair and the balloon!


Static electricity results from an imbalance between negative and positive charges in objects.

Read *Switch-On, Switch-Off* (affiliate link) by Melvin Berger

Hands-On Activity - Go outside and look at the power lines. Does it have a pole-top transformer? The transformer converts the high "primary" voltage of the overhead underground distribution lines to the lower "secondary" voltage of the distribution wires inside your house (or building). Note: the electricity cable is the one at the top. The lower (thicker) one are the cable wires.

Create your own generator (this is discussed in *Switch-On, Switch-Off* with [affiliate link](#)) a magnet and a compass.

Create Your Own Generator



Day 2:
Go over batteries, volts, electricity, electrical circuits. (page 6)

Hands-On Activity
Take a single LED light and place it on a battery. Press the two wires to the battery. The longer leg of the LED light should connect to the positive side, the shorter leg should connect to the negative side. (Glow about that a little later.) That is a simple circuit!

LED display: Label each battery

Hands-On Activity
Have the students make their own circuits with bulbs and both holder (optional), wire or alligator clips, battery.


Also include: Make Your Own Battery
Also include: Make Your Own Battery
Also include: Make Your Own Battery

You can have [affiliate link](#) or [affiliate link](#) available for the kids to work with.

On your own use a battery holder like this that holds a AA battery or AAA battery. You might want to purchase a [affiliate link](#) for the Extension 2 activity.

Fill out the page on Batteries (page 10)
Extension: Have the students find some materials they think might be conductive. Add that to the circuit to see if the light bulb will still work.

Extension 2: (After filling out the Batteries page (that follows) have the students try this: Have them make the LED light bulb work with the AAA battery. (It won't work.)



Electricity and Circuits Unit: Making Simple Circuits

Students and...
Circuit breakers and...
Circuit breakers and...
Circuit breakers and...
Circuit breakers and...
Circuit breakers and...

Draw a schematic for a parallel circuit.

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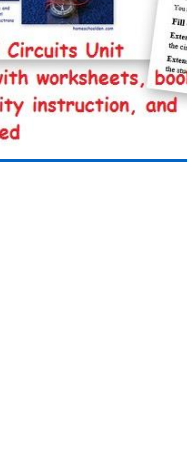
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Electricity and Circuits

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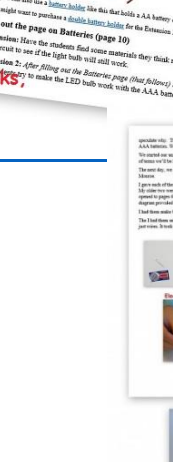
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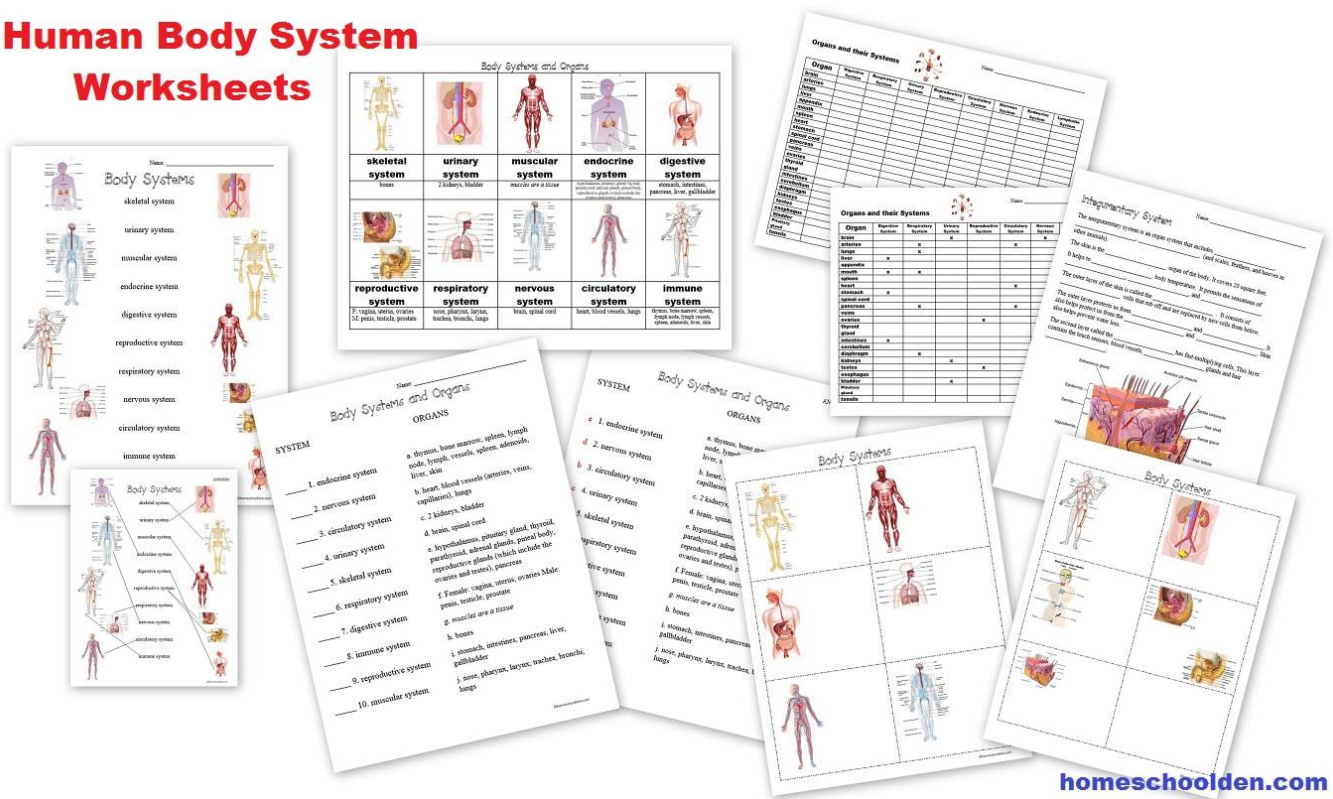


Electricity and Circuits Unit: Making Simple Circuits

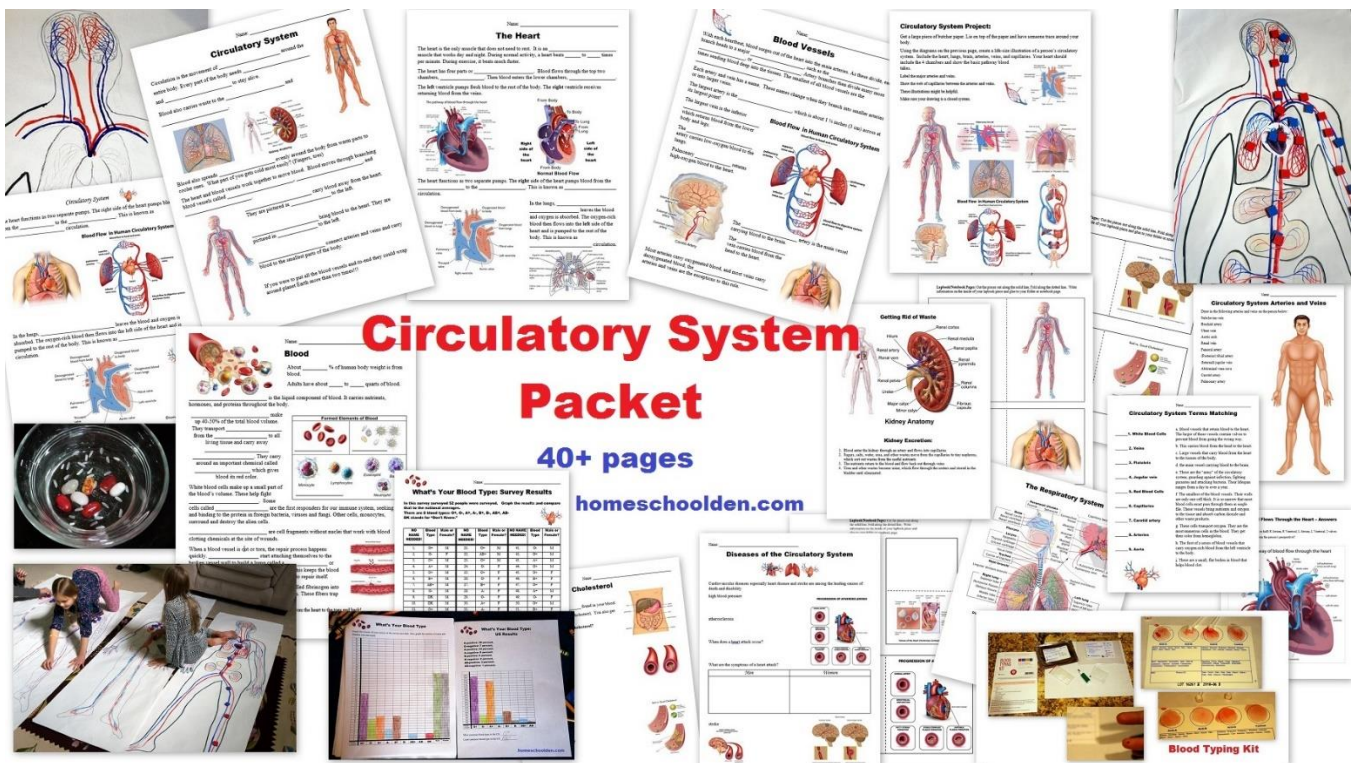
Students and...
Circuit breakers and...
Circuit breakers and...
Circuit breakers and...
Circuit

Human Body Systems (25 pages)

Human Body System Worksheets



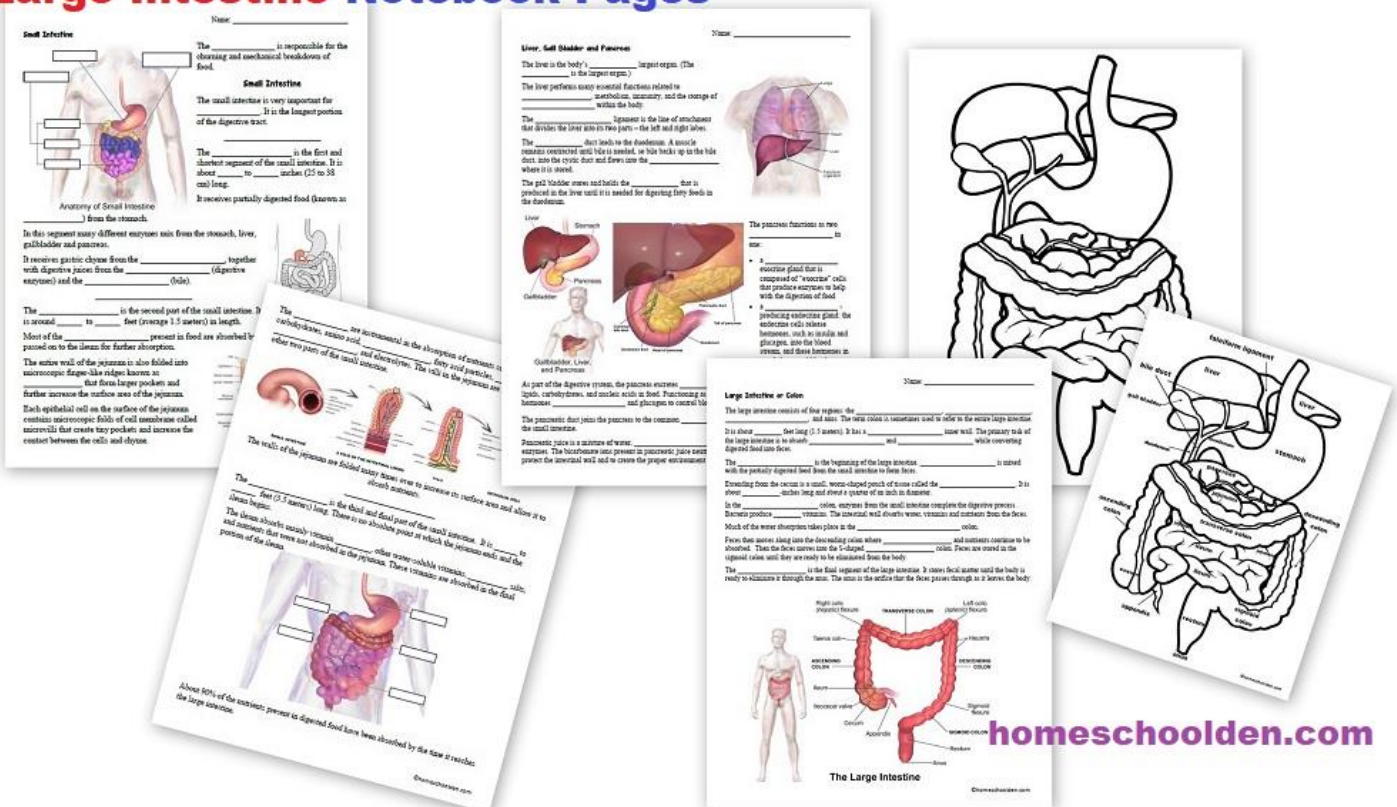
Circulatory Packet (40 pages)



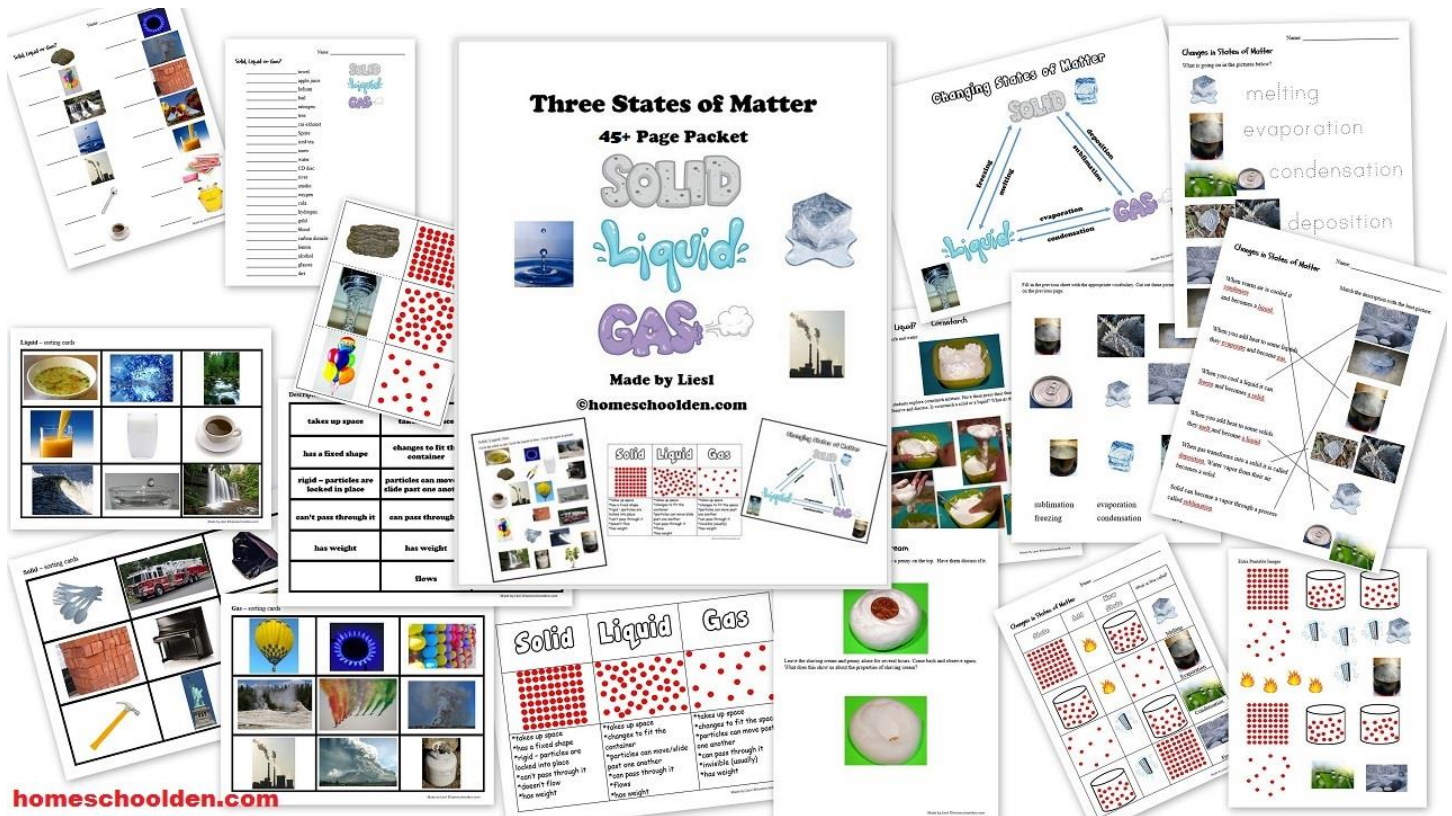
Digestive System Packet (75+ pages)



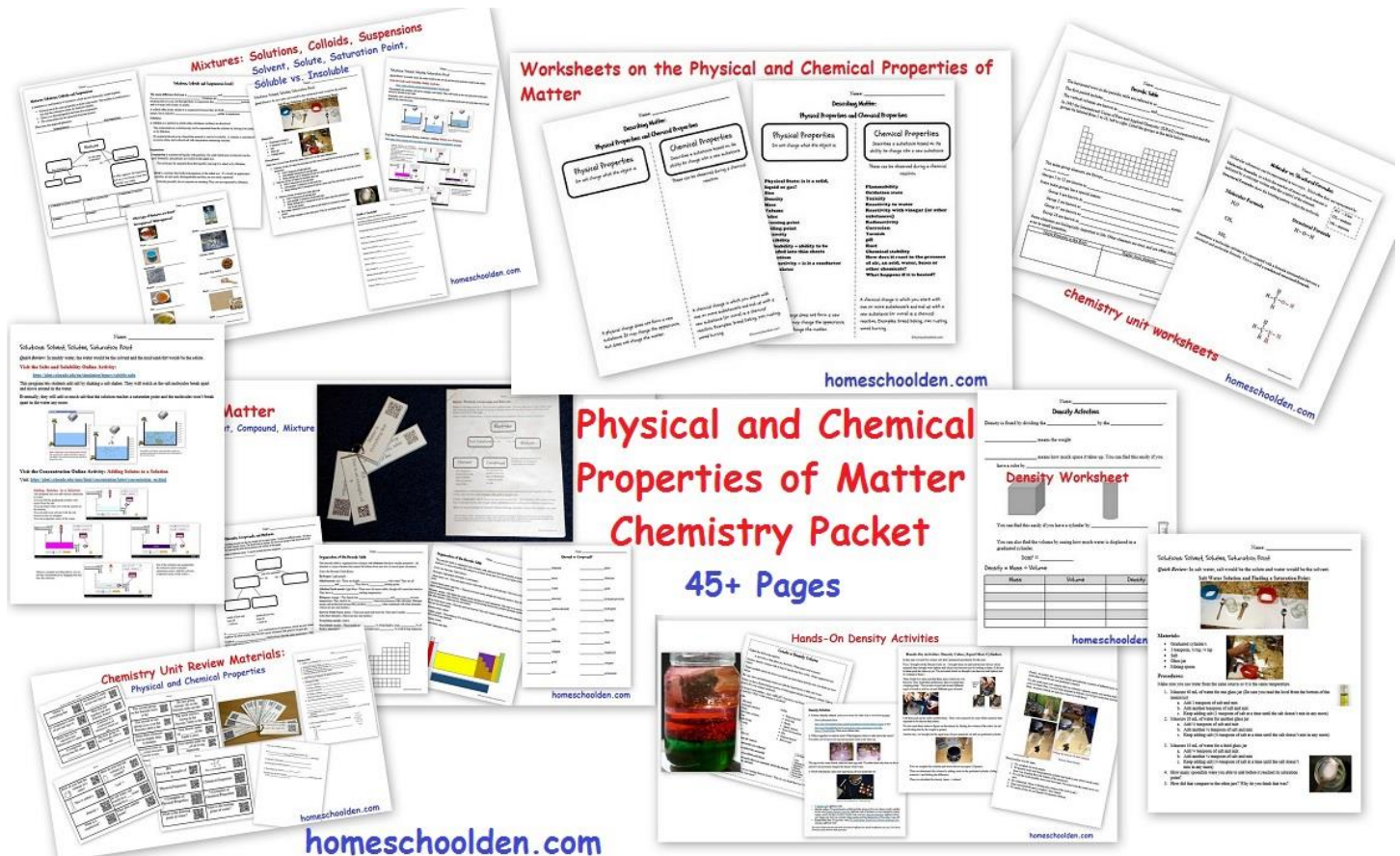
Small Intestine, Liver, Gall Bladder & Pancreas, Large Intestine Notebook Pages



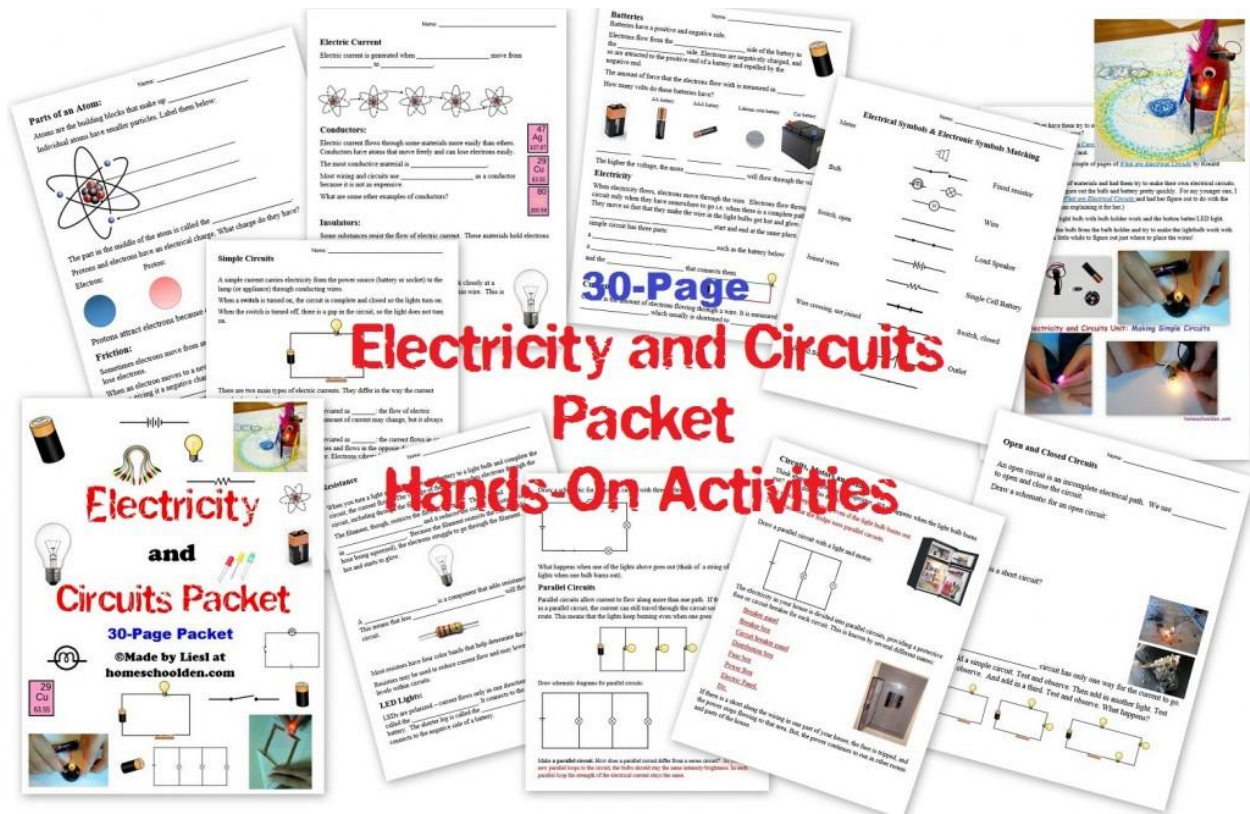
States of Matter Packet (50 pages)



Physical and Chemical Properties of Matter (45 pages)



STEM: Electricity and Circuits Unit (30 pages)



Electricity and Circuits Packet

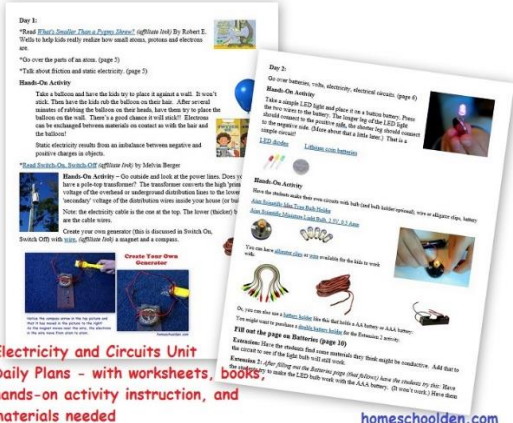
30-Page Packet

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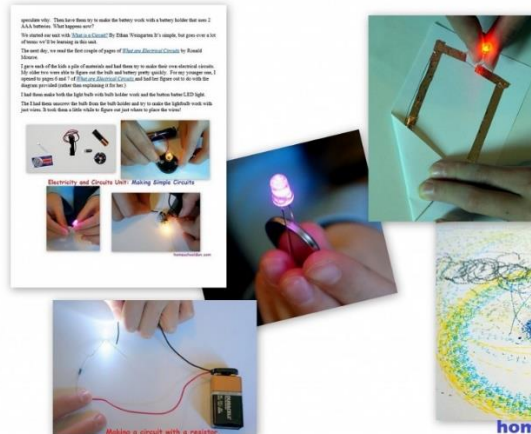
Topics in this 30-page Unit

The parts of an atom
Electric currents
Conductors and insulators
Parts of a light bulb
Batteries
Volts, amps, ohms
Electrical circuits: Power source, load, conductor
Simple Circuits
Direct and Alternating Current (DC and AC)
Resistance, Resistors and How they work.
Anode, cathode
Electrical Symbols
Open and closed circuits
Short circuits
How to draw basic electrical schematics
Series circuits
Parallel circuits
Motors
Circuit breakers and the power grid

Here is a small sampling of the worksheets in the Electricity and Circuits Unit.



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Hands-On Activities in our Electricity and Circuits Unit



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Big Animal BUNDLE



The **Big Animal BUNDLE** includes 5 packets. 1) Animal Unit, 2) World Animals Packet, 3) Rainforest Packet, 4) Life Cycles Packet, 5) Winter Packet.

You can scroll down below to see more pictures or click on the “Quick Preview” links below.

Quick Previews

- Animal Packet [Quick Preview](#)
- World Animal Packet [Quick Preview](#)
- Rainforest Packet [Quick Preview](#)
- Life Cycle Packet [Quick Preview](#)
- Winter Packet and Hibernation Unit [Quick Preview](#)

The **Animal Unit** is 100+ pages. It covers basic animal classification, animal characteristics, body coverings: feathers, fur, scales or skin, vertebrate groups, invertebrate groups, herbivores vs. carnivores, domesticated vs. wild animals, animals and their tracks, nocturnal vs diurnal animals, animal homes and shelters and more!

The **World Animal Packet** is 75+ pages. It covers animals of the 7 continents. There is a new section all about African animals of the savanna.

The **Rainforest Packet** is 50+ pages. Here’s the table of contents for this packet:

- Amazon Rainforest Facts – Notebook pages and answers pp. 3-4
- Amazon Rainforest Biodiversity and Deforestation pp. 5-6
- Map Work –South America – Brazil pp. 7-8
- Amazon River Notebook Page and answers pp. 10-11

- Average Rainfall in Temperate vs. Tropical Climates (Activity) pp. 12-13
- Amazonian Animals Montessori 3-Part Cards pp. 14-18
- Amazonian Animals Matching Page and answer sheet pp. 19-20
- Animals of the Amazon Blank Research Cards pp. 21-31
- Amazon Animal Fun Fact Tracing Pages pp. 33-35
- Insects of the Amazon pp. 36-37
- Insects of the Amazon, Montessori 3-Part Cards pp. 38-39
- Insects of the Amazon Matching Page and Answer Sheet 40-41
- Insects of the Amazon blank research cards pp. 42-44
- Layers of the Rainforest Activities pp. 45-58

The **Life Cycles Packet** is 50+ pages. It helps kids become familiar with the different stages in the life cycles of the chicken, sea turtle, frog, mosquito, butterfly, dragonfly, bee, mouse, and ladybug.

The **Winter Packet** is 100+ Pages. It also includes the **Hibernation Unit**. The first part covers Growing Crystals, Months/ Seasons, Earth's Axis and the Seasons, Arctic vs. Antarctica, Polar Animals, Penguins, Seals, Whales, about a dozen PreK Activity Pages. The Hibernation Unit covers: why animals hibernate, terms such as torpor, brumation, estivation, diapause, endotherms vs. ectotherms. Plus, it covers where animals spend the winter and the dangers of hibernation. It includes various activities such as notebook pages, interactive notebook/lapbook pieces, matching and tracing pages.

These packets can be purchased here at the [Big Animal BUNDLE](#) page or in [Our Store](#).

More pictures of what is included in this Bundle:

1) Animal Unit (100+ pages)

Animal Unit
100+ Page Packet

Feathers, Fur, Scales, Skin
Animal Characteristics
Types of Animals
Vertebrate Groups
Invertebrate Groups
Domesticated vs. Wild Animals
Animals and their Tracks
Nocturnal vs. Diurnal Animals

Classification of Animals

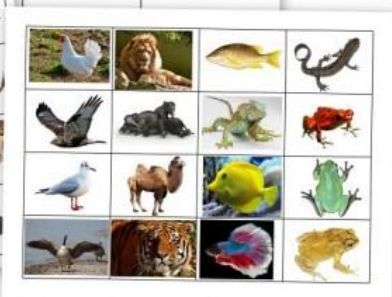
Animal Classification Activity

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Animal Body Coverings Feathers, Fur, Scales or Skin?

Part of the 50+ page
Animal Packet



homeschoolden.com

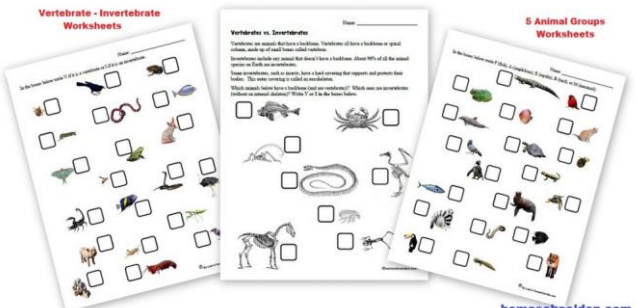
5 Animal Groups

What am I? Worksheets



homeschoolden.com

Vertebrate - Invertebrate Worksheets



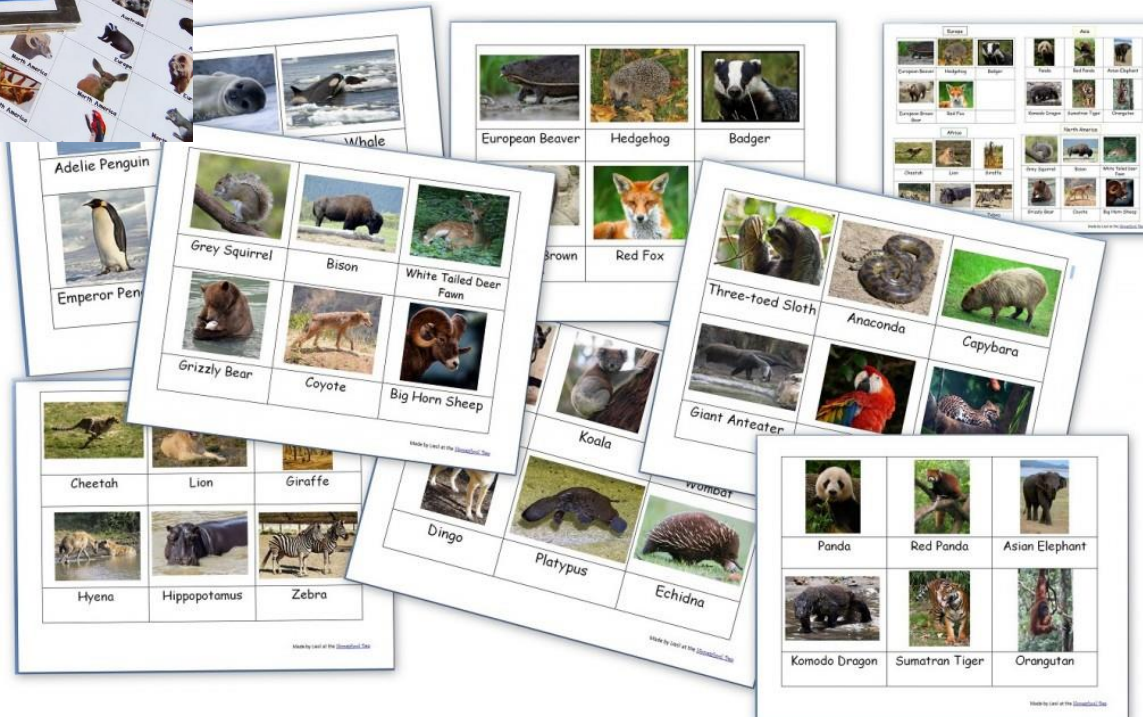
homeschoolden.com

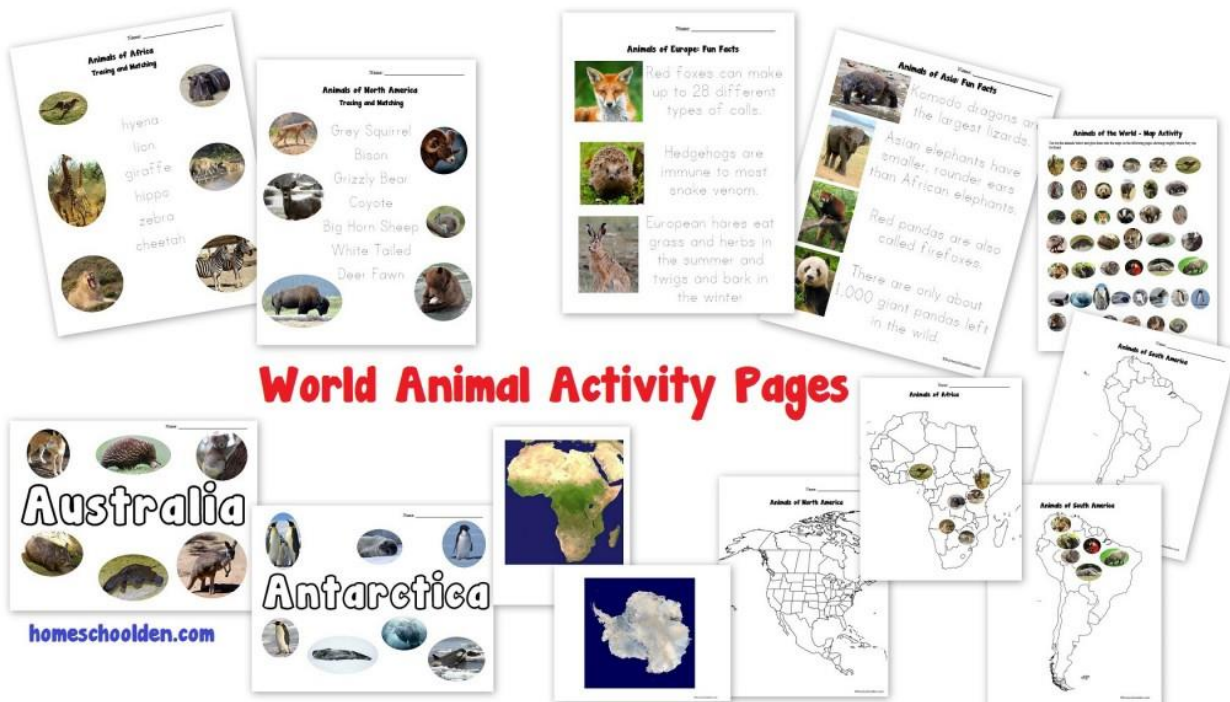
Animal Homes & Shelters



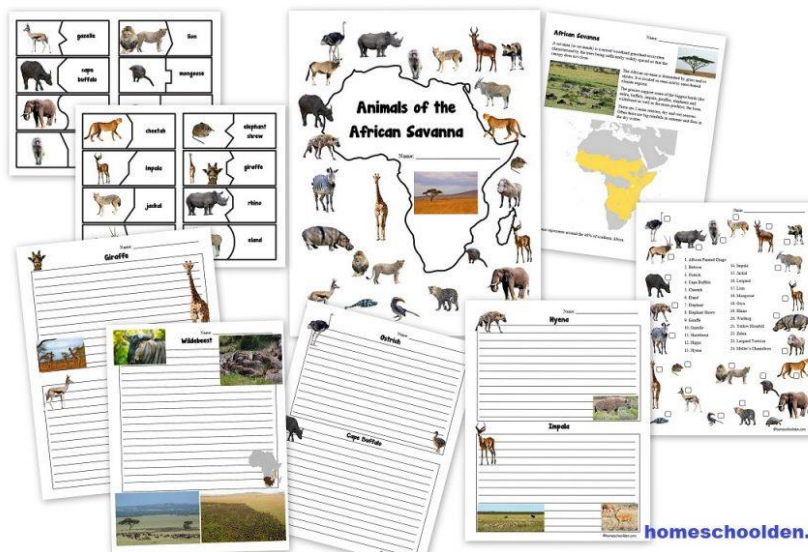
homeschoolden.com

2) World Animal Packet – Animals around the world – from the 7 Continents (75+ pages)





World Animal Activity Pages

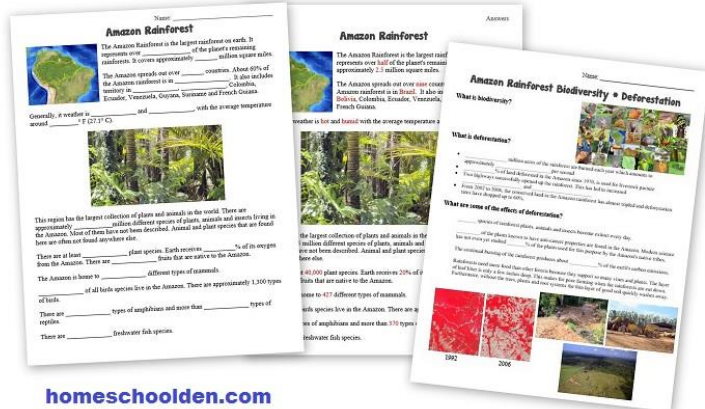


3) Rainforest Unit (50+ pages)

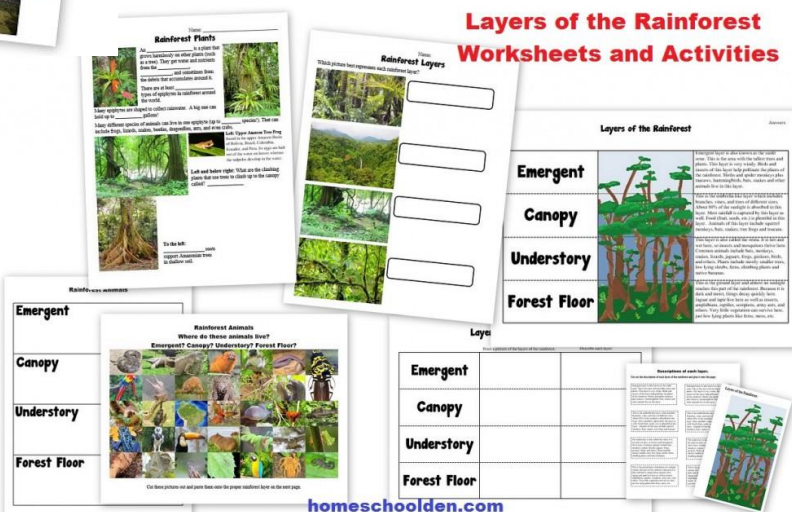


Rainforest Unit 50+ pages

Amazon Rainforest Packet



Layers of the Rainforest Worksheets and Activities



Rainforest Insects

Name: _____

Rainforest Insects

The rainforest is where the greatest abundance of species of insects can be found. Insects are almost everywhere because _____.

Many insect species only live on a few acres range which makes them vulnerable to _____.

The Amazon rainforest may house as many as _____ species of insects, although only a tiny fraction of this number has been described by scientists. Some scientists estimate that _____ % of the animal biomass of the Amazon Basin is made up of _____.

One tree may house more than _____ different species of beetles!

There are _____ species of 'mammals' in the rainforest compared to _____ in the 30,000 worldbirds.

Titans Beetles (Pictured right) is the largest of all beetles. It can grow to be more than _____ inches. It can fly, but it can't get into the air from the ground. It has to climb trees and launch itself into the air.













Goliath Bird-eating Spider Goliath is the largest spider in the world. It is one of the _____.

Golden Bird-eating Spider Golden Bird-eating Spider is the _____.

Name: _____

Insects of the Rainforest

- ☐ Goliath Bird-Eating Spider
- ☐ Tropical Skimmer Dragonfly
- ☐ Jewel Beetle
- ☐ Army ants
- ☐ Titan Beetle
- ☐ Scorpion
- ☐ Archaeoprosopa meander butterfly
- ☐ Mosquitoes
- ☐ Leaf Cutter ants

 Scorpion	 Goliath Bird-Eating Spider	 Titan Beetle
 Archaeoprosopa meander butterfly	 Tropical Skimmer Dragonfly	 Bugs and Insects
 Macramyx suturalis	 Mosquitoes	 Leaf Cutter Ant
 Army Ants	 Titan Beetle	 Bugs and Insects

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Animals of the Amazon

 Sloth	 Capybara	 Yellow-Banded Poison Dart Frog
 Kinkajou	 Amazonian	 Jaguar
 Howler Monkey	 Caiman	 Caecilian
 Toucan	 Emerald Tree Boa	 Iguana
 Golden Lizard	 Sloth	 Capybara

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Amazon Rainforest Animals Fun Fact Pages!

Name: _____

The Amazon Rainforest: Fun Facts!

The poison dart frogs got their name because hunters would tip their arrows in the frog's poisons.

The golden poison dart frog is one of the 20,000 nice!

The Brown Basilisk is sometimes called the Jesus Lizard because it can run on water!

Name: _____

The Amazon Rainforest: Fun Facts!

Sloths are among the slowest moving animals on Earth!

Sloths can extend their tongues 10 to 12 inches out of their mouths.

The capybara is the world's largest rodent. They grow to be 4 feet long!

What are some other rodents? Rats, mice

Name: _____

The Amazon Rainforest: Fun Facts!

The toucan's coloring acts as camouflage in the rainforest. Their beaks are sometimes mistaken for fruit.

The green anaconda is the largest snake in the world. The average size is 20 feet long and 300 pounds!

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Rainforest Animal Blank Research Cards

Blank research cards for rainforest animals, featuring images of a sloth, toucan, and capybara.

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Trees in the Rainforest grow to be almost twice as tall as trees in a temperate forest.



Comparing Tropical and Temperate Forests

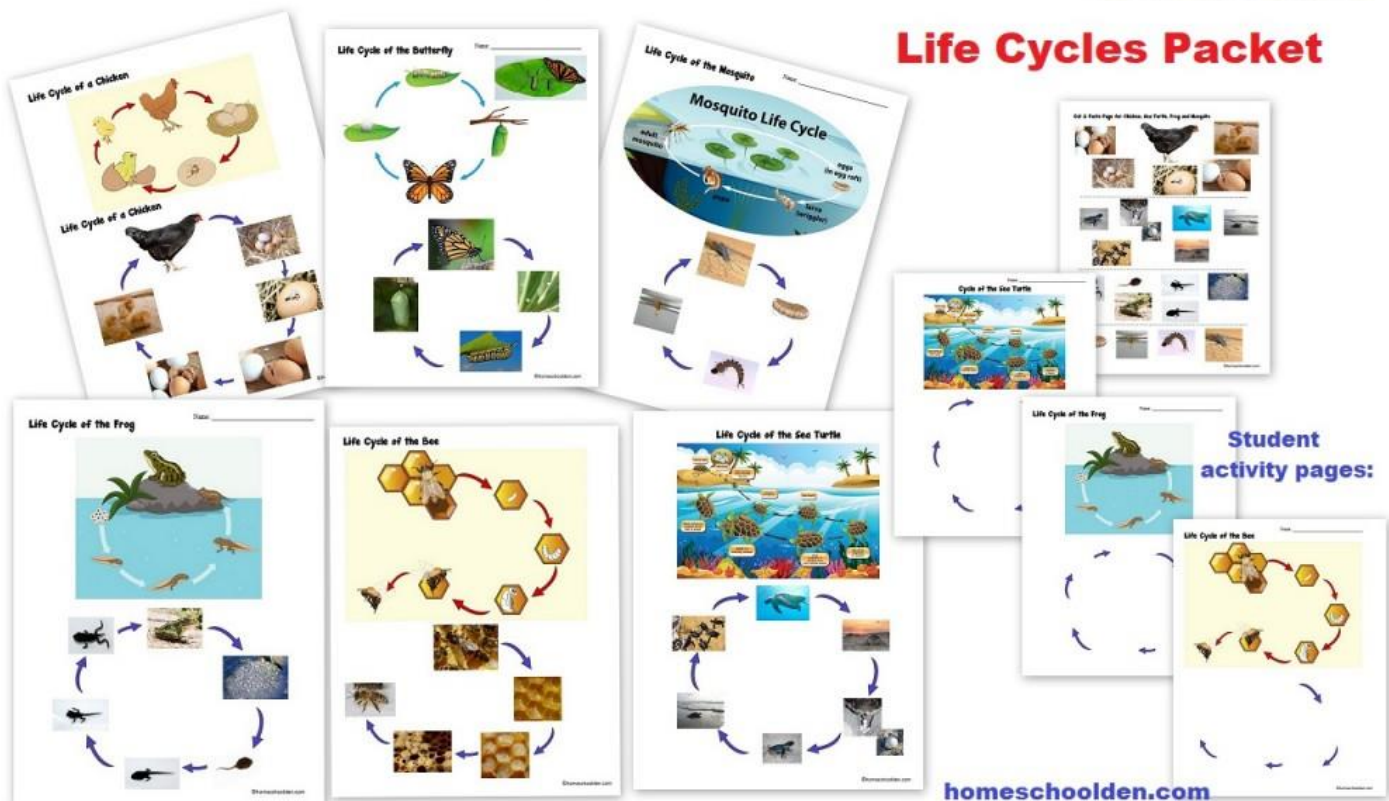
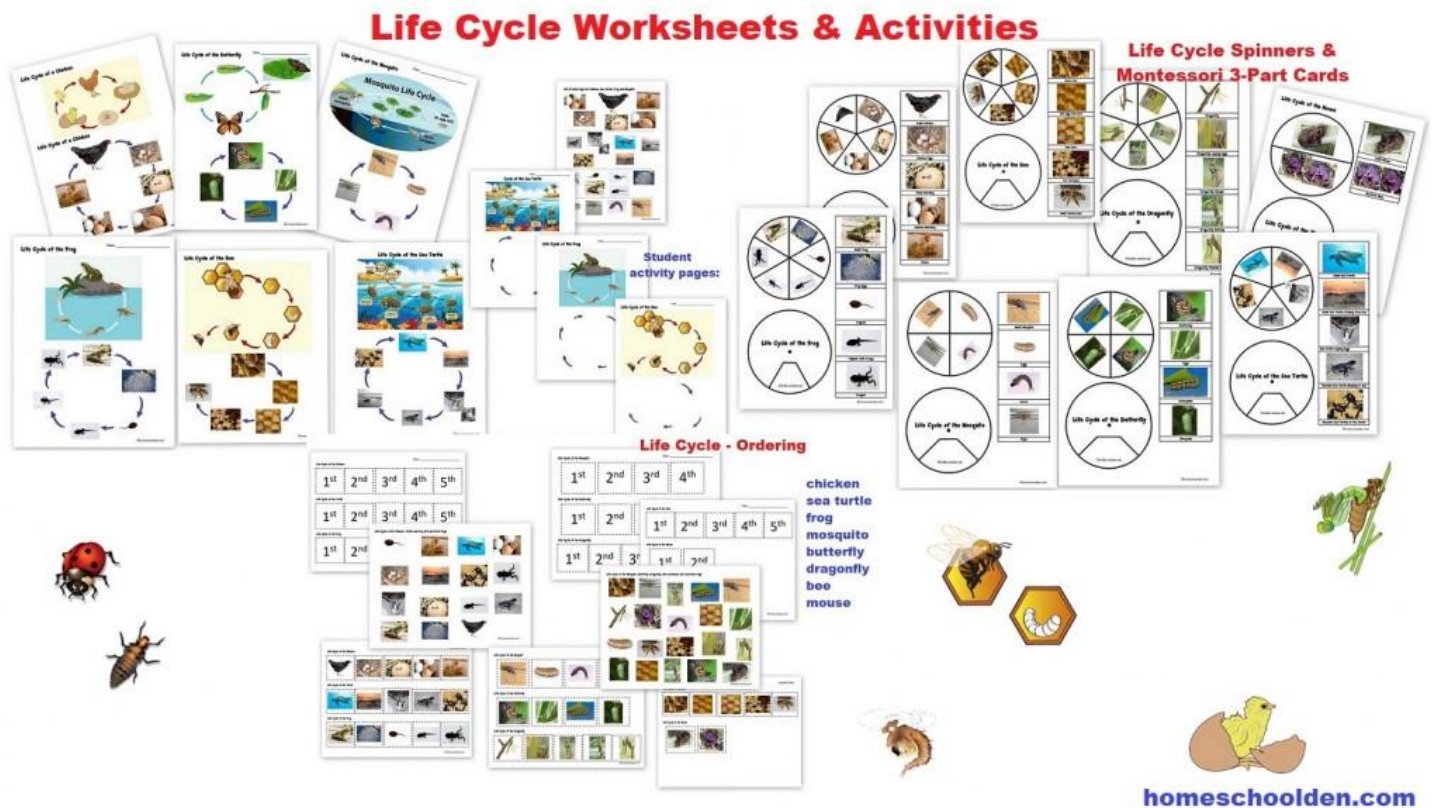
What happens when people cut down rainforests for farms?

Any available nutrients are depleted quickly by farming. Furthermore, much of the topsoil is washed away because there are no plant roots to keep the soil in place.

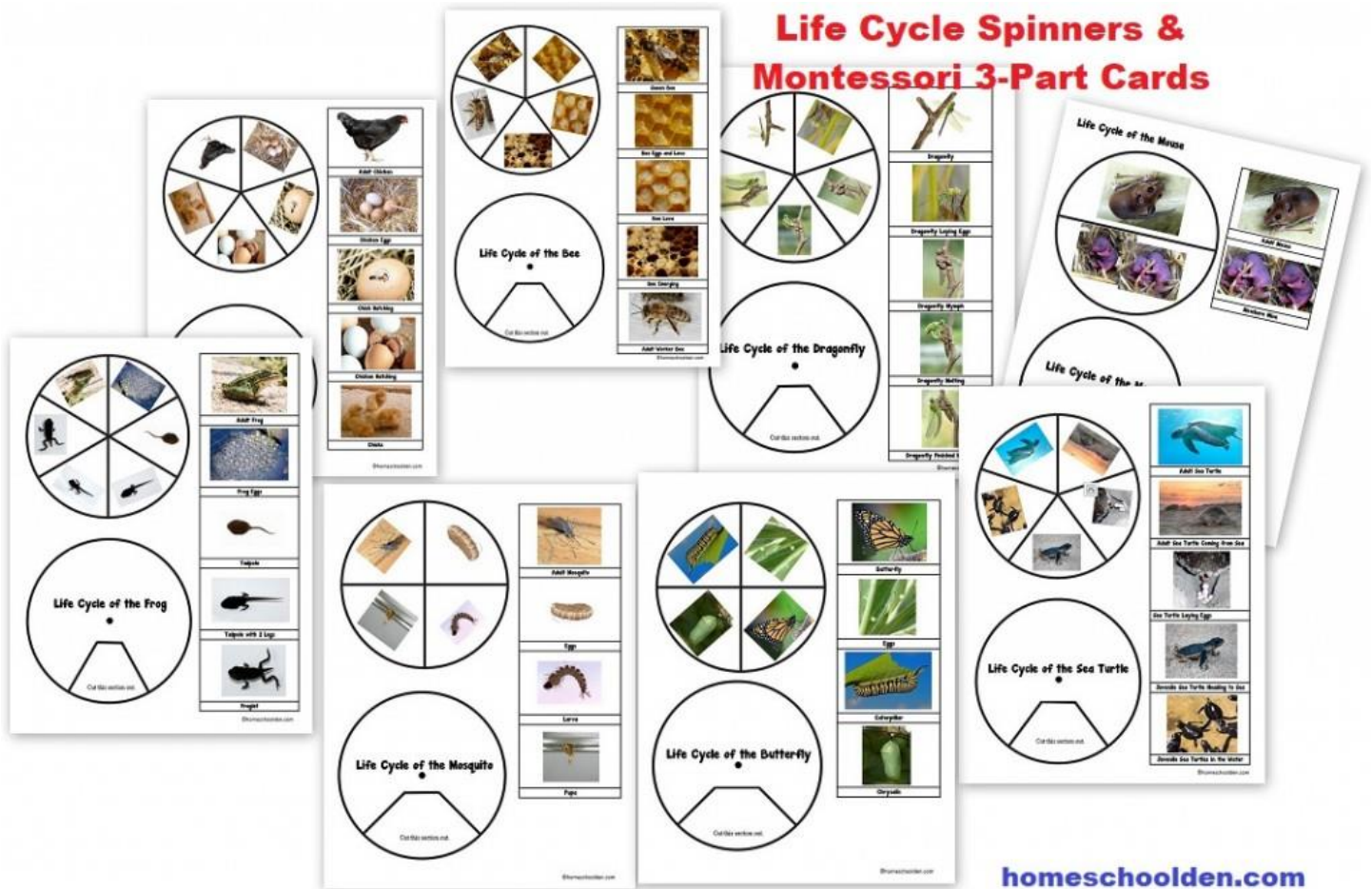
homeschoolden.com

4) Life Cycles Worksheets and Activities (50+ pages)

This 50+ page Life Cycles Packet helps kids become familiar with the different stages in the life cycles of the chicken, sea turtle, frog, mosquito, butterfly, dragonfly, bee, mouse, and ladybug.

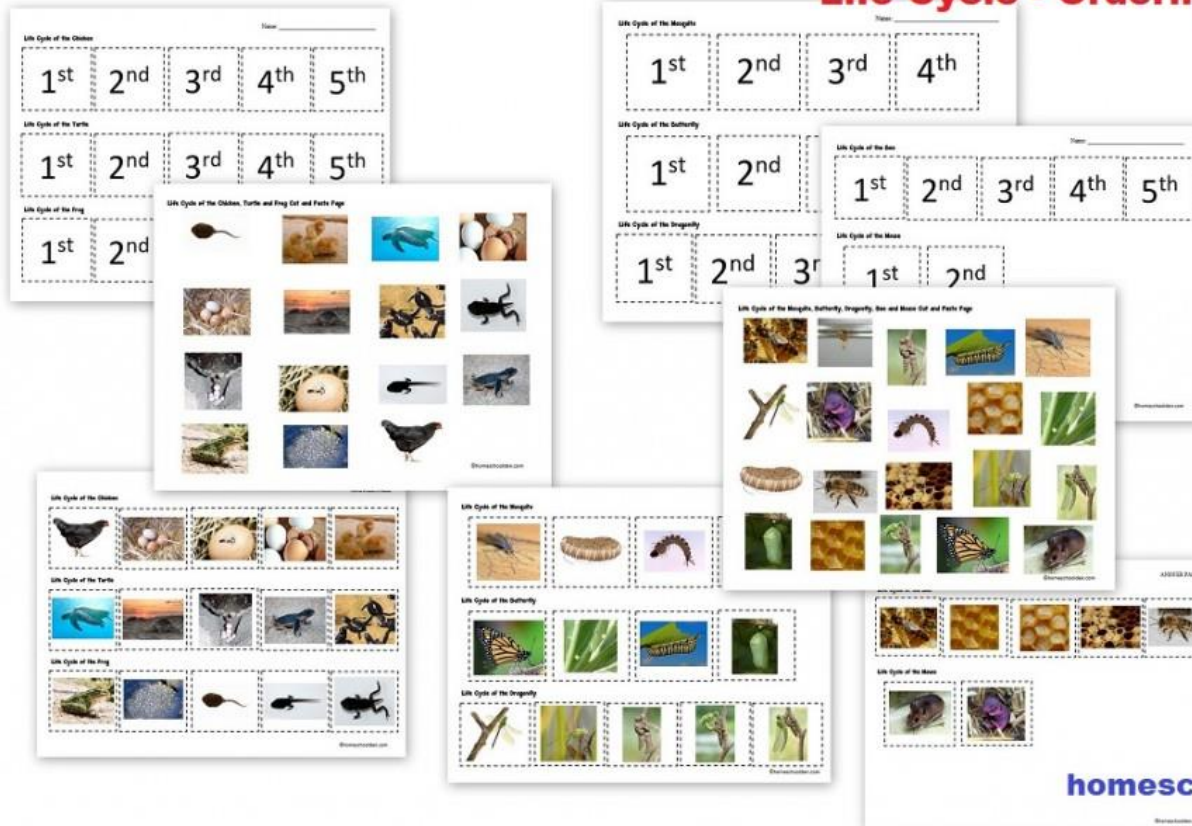


Life Cycle Spinners & Montessori 3-Part Cards



homeschoolden.com

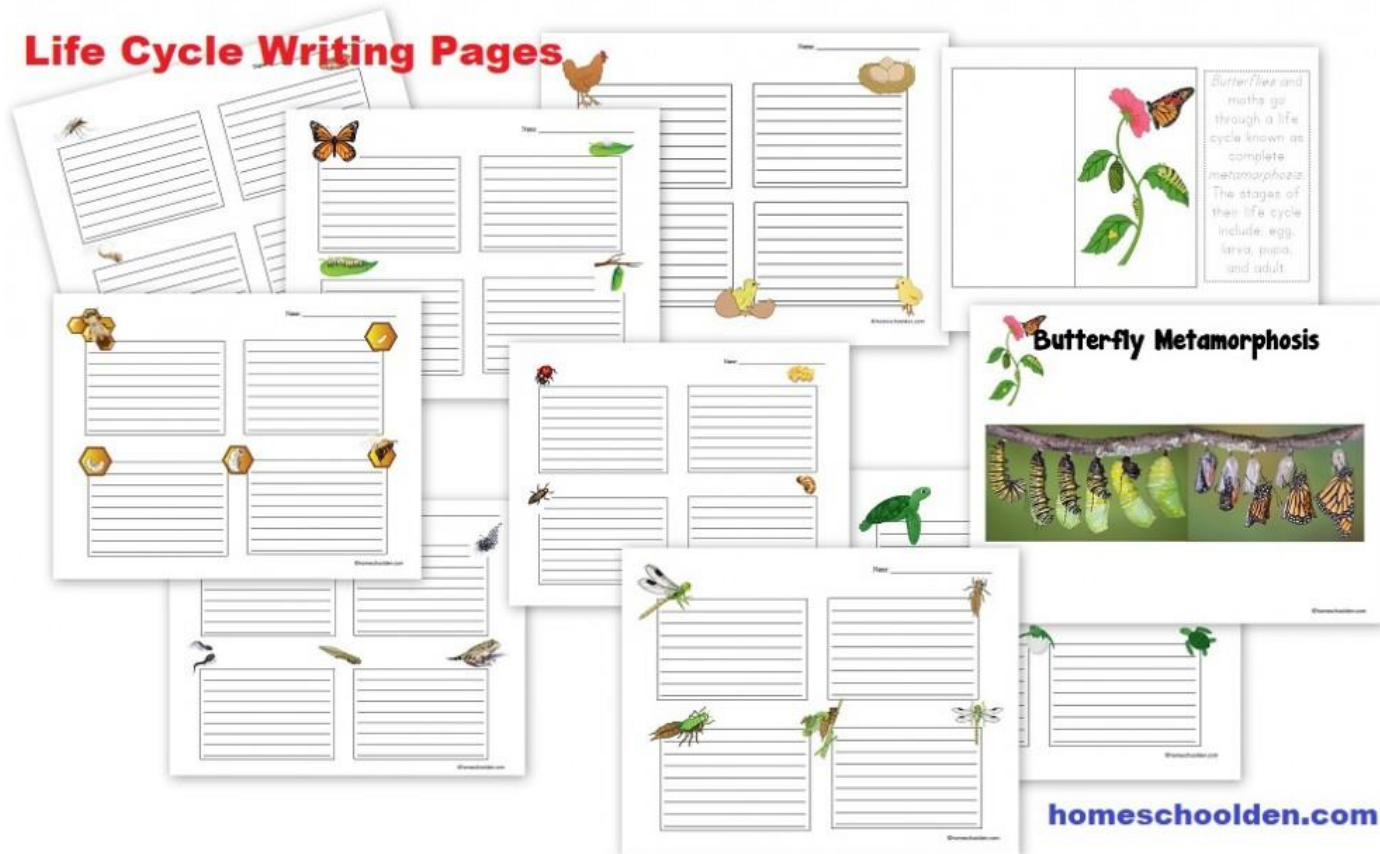
Life Cycle - Ordering



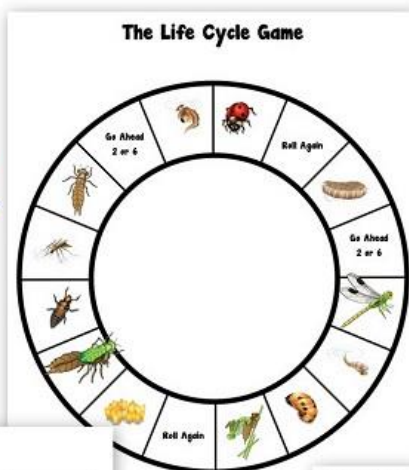
chicken
sea turtle
frog
mosquito
butterfly
dragonfly
bee
mouse

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Life Cycle Writing Pages



Life Cycle Game
Be the first player
to fill your life
cycle card!



Mosquito Player Card



Dragonfly Player Card



Ladybug Player Card

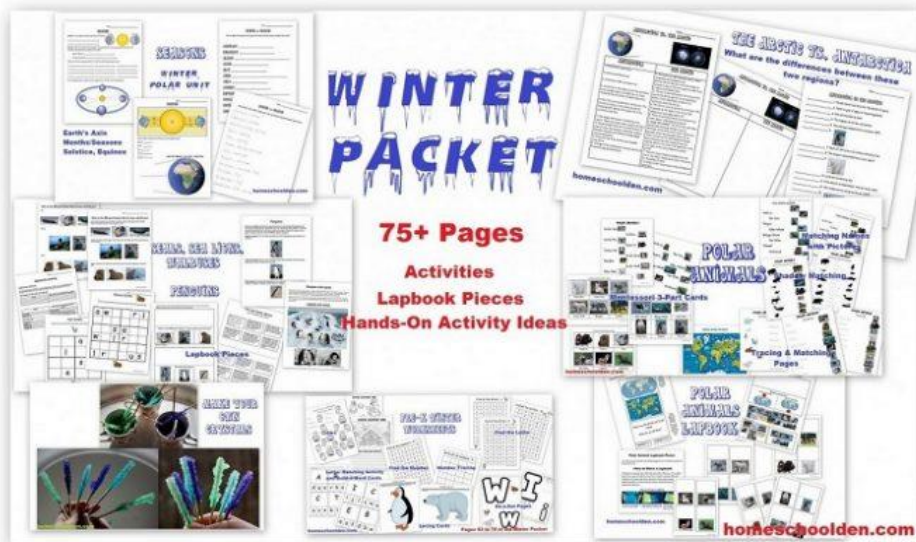


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Hibernation Unit (100+ pages)

5) Winter Packet and

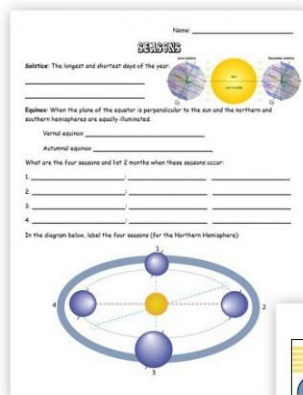
The **Winter Packet** is now 100+ pages because it has been updated to include the **Hibernation Unit**.



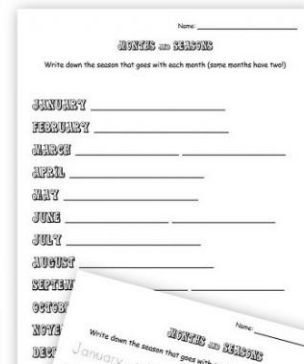
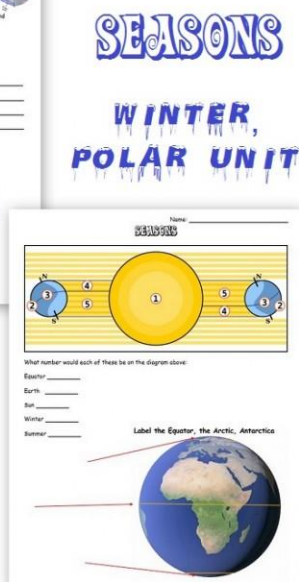
What is included in the Winter Packet?

- * Earth's axis and how/why the tilt of the Earth creates the different seasons
- * major differences between the Arctic and Antarctica
- * Polar Animals
- * The differences between seals, sea lions, and walruses
- * Hands-on activity ideas about whales & Lapbook pieces
- * Hibernation Unit

Hibernation Topics Include: why animals hibernate, terms such as torpor, brumation, estivation, diapause, endotherms vs. ectotherms. Plus, it covers where animals spend the winter and the dangers of hibernation.



**Earth's Axis
Months/Seasons
Solstice, Equinox**




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THE ARCTIC VS. ANTARCTICA

What are the differences between these two regions?

NAME: _____

ANTARCTICA VS. THE ARCTIC




ANTARCTICA	THE ARCTIC
1. Antarctica is a continent.	1. The Arctic is a semi-enclosed ocean, almost completely surrounded by land.
2. Land surrounded by sea.	During much of the year, the Arctic Ocean is covered in sea ice that can exceed six feet thick.
3. Antarctica is 98% covered in ice.	2. Sea surrounded by land.
4. Antarctica is the highest of all the continents at an average height of 2,300m (or 1.4 miles). Temperatures are colder at higher elevations.	3. The sun is continually above the horizon from around the March equinox to the September equinox. From September to March it is continually below the horizon.
5. Plant life is not as plentiful in Antarctica. The Antarctic has only moss, algal, and a few flowering plant species. Only about 1% of the continent is ice free.	4. The Arctic is not as cold as the Antarctic. This is because of the water in the Arctic (The temperature never goes below -47°).
6. The largest land animal in Antarctica is an insect! There are a great many animals that feed in the sea though come onto the land for part or most of their lives: penguins, seals (Fur, leopard, Weddell), elephant and orcas (killer whales), birds such as albatrosses.	5. There is more plant life on the tundra of the Arctic (about 1,700 species of plants).
7. Antarctica has never had any native people living there.	6. Large land animals: The Arctic has many large land animals including reindeer, musk ox, lemmings, arctic hares, arctic terns, snowy owls, squirrels, arctic fox and polar bears. As the Arctic is a part of the land masses of Europe, North America and Asia, these animals can migrate south in the winter and head back to the north again in the more productive summer months.
8. Average winter temperature: has such as low as minus 135 degrees Fahrenheit.	7. There are many indigenous people who have lived in the Arctic. People have lived in the Arctic for thousands of years.
	8. Average winter temperature: minus 40 degrees Fahrenheit.




NAME: _____

ANTARCTICA VS. THE ARCTIC




NAME: _____

ANTARCTICA OR THE ARCTIC?

- People have lived here for thousands of years.
- Home to just 3 types of flowering plants.
- Sea surrounded by land.
- The highest of all the continents.
- The average temperature is around -40°F.
- 
- Much of this area is an ocean covered by ice.
- The largest land animal here is an insect!
- 
- Land surrounded by sea.
- From March to September, the sun never sets!
- The temperature can go as low as -135°F.
- 

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POLAR ANIMALS

POLAR ANIMALS

Arctic Tern

Caribou

Arctic Fox

Musk ox

Snowy owl

Arctic Hare

Reindeer

Arctic Wolf

Polar Bear

Matching Names with Pictures

Walrus

Sea Lion

Penguin

Killer Whale

Beluga Whale

Sea Otter

Weasel

Wolverine

Shadow Matching

Arctic Tern

Caribou

Arctic Fox

Snowy owl

Reindeer

Arctic Wolf

Polar Bear

Tracing & Matching Pages

Penguin

Walrus

Weasel

Arctic Fox

Polar Bear

Killer Whale

Beluga Whale

Sea Lion



ARCTIC COVERED THE GLOBE

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Hibernation Unit

[illegible]

Where Do Animals Hibernate?

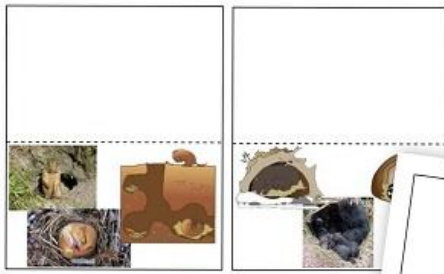
[illegible]

Where do animals hibernate:

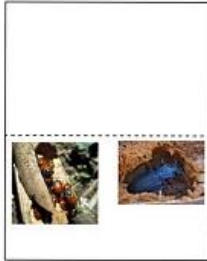
interactive notebook activity

matching page

tracing pages



Where do Animals Spend the Winter?



Where Do They Hibernates?

Woodchucks, ground squirrels, mice and others hibernate in burrows.

Bears, skunks, raccoons and others spend the winter in dens.

Bats hibernate in dark caves.

Where Do They Hibernates? (Cont.)

Some animals like snails, ladybugs, turtles and frogs spend the winter under rocks, logs, leaves, or bark.

Some animals like crayfish, snapping turtles, and other types of frogs, spend the winter on or under the mud.

Where Do They Hibernates?

1. in a burrow
2. in a den
3. under cover (under logs, rocks, leaves, bark, etc.)
4. on or in the mud (under water)
5. in dark caves
6. in groups

Animals: brown bear, wood frog, ground squirrel, garter snakes, crayfish, raccoon, box turtle, snail, skunk, bat.

Where Do They Hibernates?

1. in a burrow
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Biology BUNDLE of 3

We also have a **Biology BUNDLE of 3**: 1) Biology Unit (Biomes, habitats, food chains/webs, feeding relationships) 2) Scientific Classification & Taxonomy Packet 3) Ocean Unit & Layers of the Ocean/Ocean Zone Activities

- [Biology Packet Quick Preview](#)
- [Scientific Classification and Taxonomy Quick Preview](#)
- [Ocean Packet Quick Preview](#)

After our family did the Animal Unit, we went on to study the biosphere. We talked about the different biomes, animal feeding relationships and more.

Biology Unit: Biomes, habitats, ecosystem, biological interactions (symbiosis, mutualism, amensalism, etc.), feeding relationships (70 pages)

The Biosphere Levels of Organization

Individual
Population
Community
Ecosystem
Biome
Biosphere

Climate Zones

Polar Zone
Temperate Zone
Tropical Zone

Food Chain

Producers (plants)
Primary Consumers (herbivores)
Secondary Consumers (carnivores)
Tertiary Consumers (top predators)

Energy Pyramid

Energy flows from the sun to producers, then to consumers.

Biological Interactions

Symbiosis: mutualism, commensalism, parasitism
Competition
Predation
Succession

Biological Succession

Primary succession
Secondary succession

What is a habitat?

A habitat is a place where an organism lives and grows.

Feeding Relationships

Producers (plants)
Primary Consumers (herbivores)
Secondary Consumers (carnivores)
Tertiary Consumers (top predators)

Biomes and their Abiotic Factors

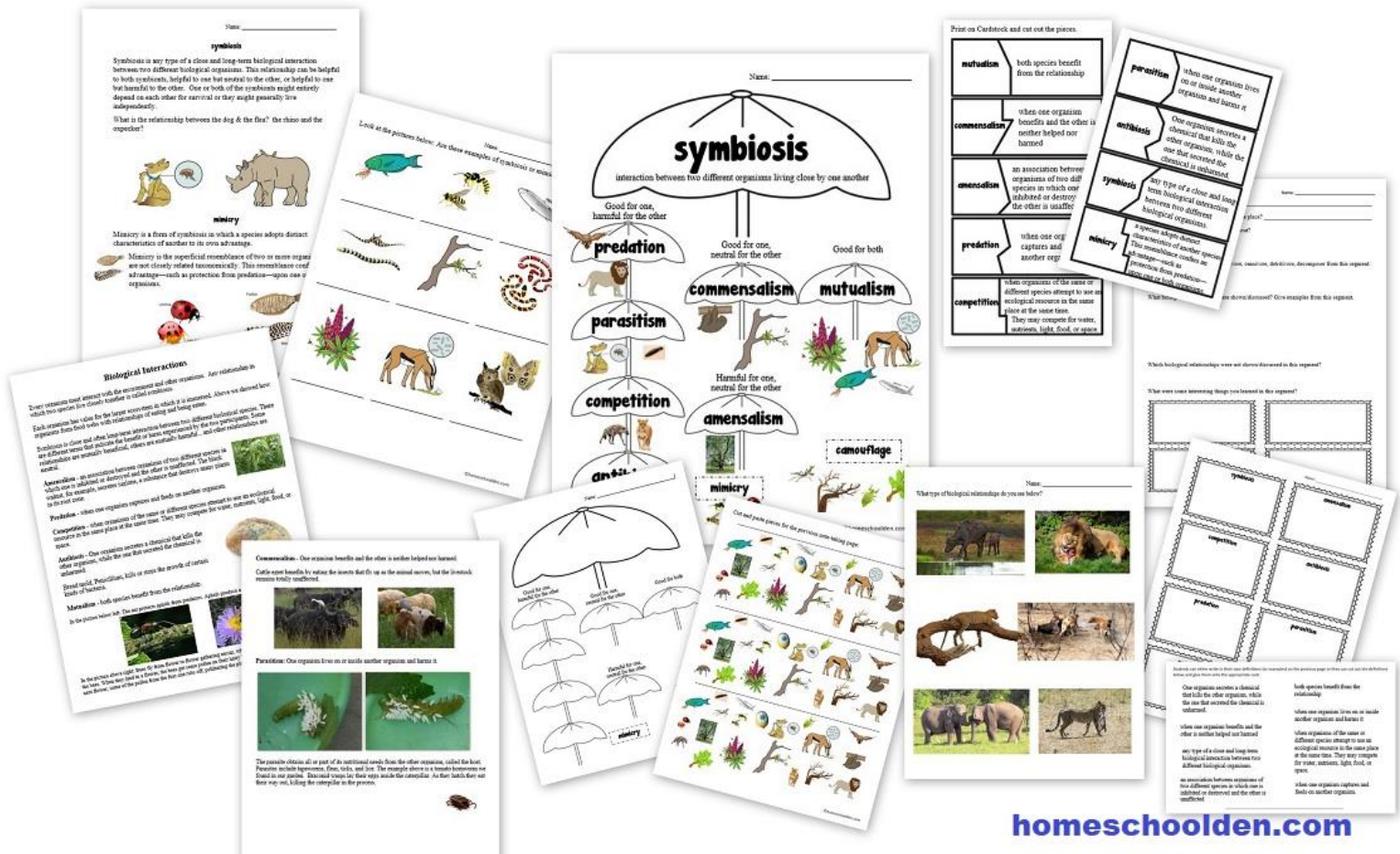
Grassland
Temperate Deciduous Forest
Temperate Boreal Forest
Arctic and Alpine Tundra
Tropical Savanna
Desert
Chaparral

Biome Matching

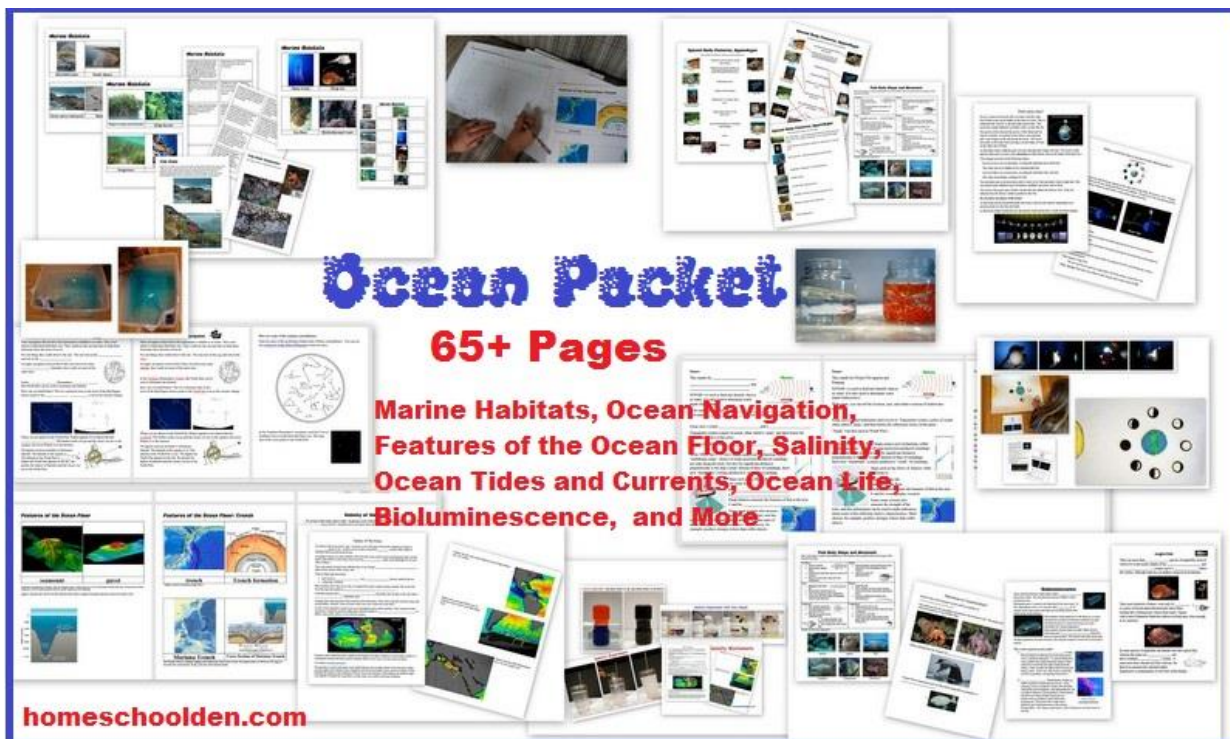
Match the biome to its characteristic image.

Biology Unit: This 70-page packet covers the biosphere: Biomes, Ecosystems, Habitats, Food Chain/Food Webs, Feeding Relationships, Energy Pyramid, Biological Interactions: symbiosis, mutualism, amensalism, etc.

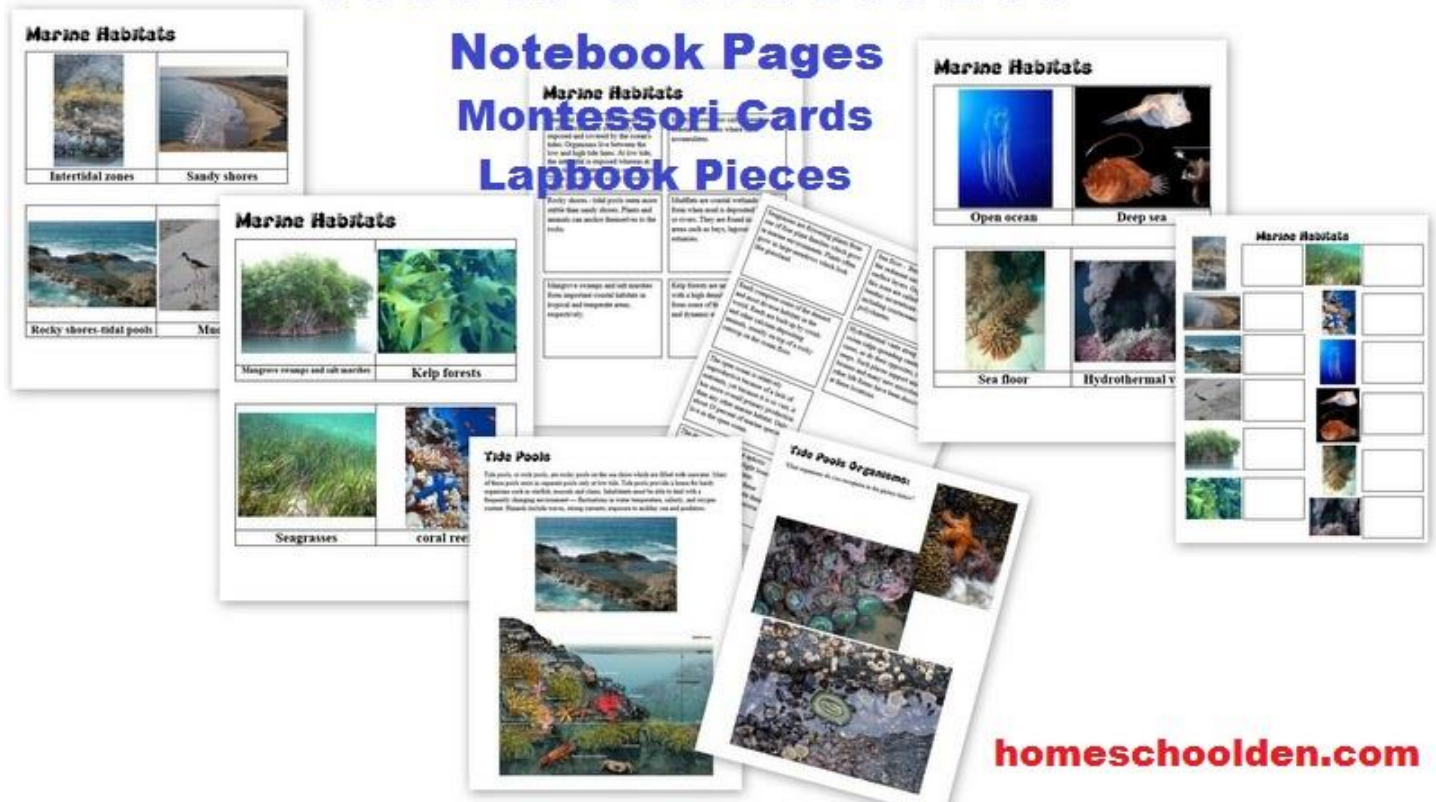
Biology Unit (continued):



Ocean Unit – Layers of the Ocean/Ocean Zone




Marine Habitats



Fish: Special Body Features

Special Body Features, Appendages

Find examples of each below. Some can be used more than once.

- venomous dorsal spines along their backs
 -  Arowana
- barbel (These look like whiskers, but are feeling and tasting organs near the mouth. They help the fish find food.)
 -  European Catfish
- bioluminescence
 -  Pufferfish
- strange mouth shapes
 -  Crab Jelly
- "fishing lure" to attract their prey
 -  Wolf Snout (aka Egg Eater)
 -  Puffblower (Puffers)
- sharp spines all over for protection
 -  Electric Eel
 -  Copperhead Hammerhead
- arms and tentacles for catching and holding
 -  Octopus
- claws
 -  Squid
 -  Lionfish
- electricity
 -  Anglerfish

Special Body Features, Appendages

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- claws
 -  Squid
 -  Lionfish
- electricity
 -  Anglerfish




Fish Body Shape and Movement

Fish's body shape is a result of specialization in its environment. There is great diversity in the shapes of fish and their body parts.

Fastest	Slippery
<ul style="list-style-type: none"> Fastest of all fish. Streamlined, torpedo shape. Powerful tails help them chase prey and avoid predators. Many live in the open ocean and swim continuously. 	<ul style="list-style-type: none"> When threatened, these fish fill their bodies with water or air, becoming too big to swallow. Some have spines for added protection.
Flat	Ribbon
<ul style="list-style-type: none"> Elongated, arrow-like. These hunters ambush their prey. They first motionless until a smaller fish swims near, then they lunge with lightning speed to seize their prey. 	<ul style="list-style-type: none"> Snake-like fish. Slow swimmers, but move easily through rocks and crevices, under rocks and around plants. Secretive, hiding from predators and ambushing prey.
Depressed	Compressed
<ul style="list-style-type: none"> Flat, pancake-shaped fish. Use camouflage instead of speed for survival. Flap fins up and down and swim like a bird. To escape predators, they burrow into the sand or mud. Many change the color of their skin. 	<ul style="list-style-type: none"> Flattened from side to side. When viewed from the front, these fish seem to disappear. Common on coral reefs. Compressed bodies allow them to make quick, sharp turns and dart in and out of hiding places.

Identify the fish body shape below:

barbels,
spines,
bioluminescence,
claws,
etc.

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Fish Body Shape
& Movement

Bioluminescence

Many midwater fish have light organs called _____ that produce light. This biological production of light is called bioluminescence.

Bioluminescence is common and important in the open ocean. In fact, (depending on how you count it) nearly _____% of animals in the open waters emit light (not including animals that dwell on the ocean bottom).

Most animals on this planet live in the deep sea, so some scientists have pointed out that more creatures use light (bioluminescence) to communicate than use sound (including A _____).

Some animals _____ bioluminescent _____ which they house in black pouches. The bacteria emit light all the time, but these organisms can open and closing, allowing the creature to control how much light is emitted.

Why would organisms produce light?

- _____ to hide. Many predators in midwater have upward-pointing eyes to search for silhouettes. To protect themselves, some creatures have light-producing organs on their undersides to match the dim light coming from the surface. Many can dim the light as they descend into deeper waters. In this way, they become somewhat invisible to predators viewing them from below.
- Bright flashes of light can startle a predator causing them to hesitate. Some organisms (such as ctenophores, shrimp, tube-dwelling seahorse fish, and ctenophores, and siphonophores) will use light to distract or divert predators. Some animals will shoot out clouds of light which acts as a smoke screen so predators cannot follow the escaping prey. The picture above right shows defensive open bioluminescence in the shrimp, *Parapandalus*. The vampire squid emits a cloud of luminous secretions.

Bioluminescence Worksheets

Some organisms may emit light as a warning to stay away. Possible warning bioluminescence in the _____.

body parts to lure and attract prey. Some organisms use lighted _____ that dangle in front of their mouths. Anglerfish has "fishing lures" _____ and of their tail, it is thought they use this light to attract prey to its mouth.

Right: The bioluminescent lure of the barbel dragonfish, *Eurytemora pacifica*. Organism image courtesy of www.nationalgeographic.com. Below: anglerfish.

Many creatures have specific light patterns, specific to a certain sex. Anglerfish and lantern fish are both thought to produce light to attract a mate.

In the Bathypelagic Zone (Midnight Zone), bioluminescence is as prevalent as in the Mesopelagic Zone (Twilight Zone), however in the complete darkness of this zone, there is no need for counterillumination.

Bioluminescence can be found in many organisms:

- Dinoflagellates (marine plankton) and radiolarians (protozoa - zooplankton)
- Various jellyfish
- Cnidarians (corals, anemones, etc.)
- Annelids (worms)
- Mollusks (such as gastropods)
- Cephalopods - Squid have at least 70 luminous genes
- Echinoderms (such as brittle stars, sea stars, sea cucumbers)
- Fish - one family of sharks (lantern shark) and in 42 families of bony fish
 - Anglerfish, Pufferfish, Lantern fish, Hatchet fish, Dragon fish

Bioluminescence

Many midwater fish have light organs called _____ that produce light. This biological production of light is called bioluminescence.

Why would organisms produce light?

- _____ to hide. Bright flashes of light can startle a predator causing them to hesitate.
- Some animals will shoot out clouds of light which acts as a smoke screen so predators cannot follow the escaping prey. The picture above right shows defensive open bioluminescence in the shrimp, *Parapandalus*.
- _____ as a warning to stay away. Some organisms may emit light _____.
- body parts to lure and attract prey. Some organisms use lighted _____.

Right: The bioluminescent lure of the barbel dragonfish, *Eurytemora pacifica*. Organism image courtesy of www.nationalgeographic.com. Below: anglerfish.

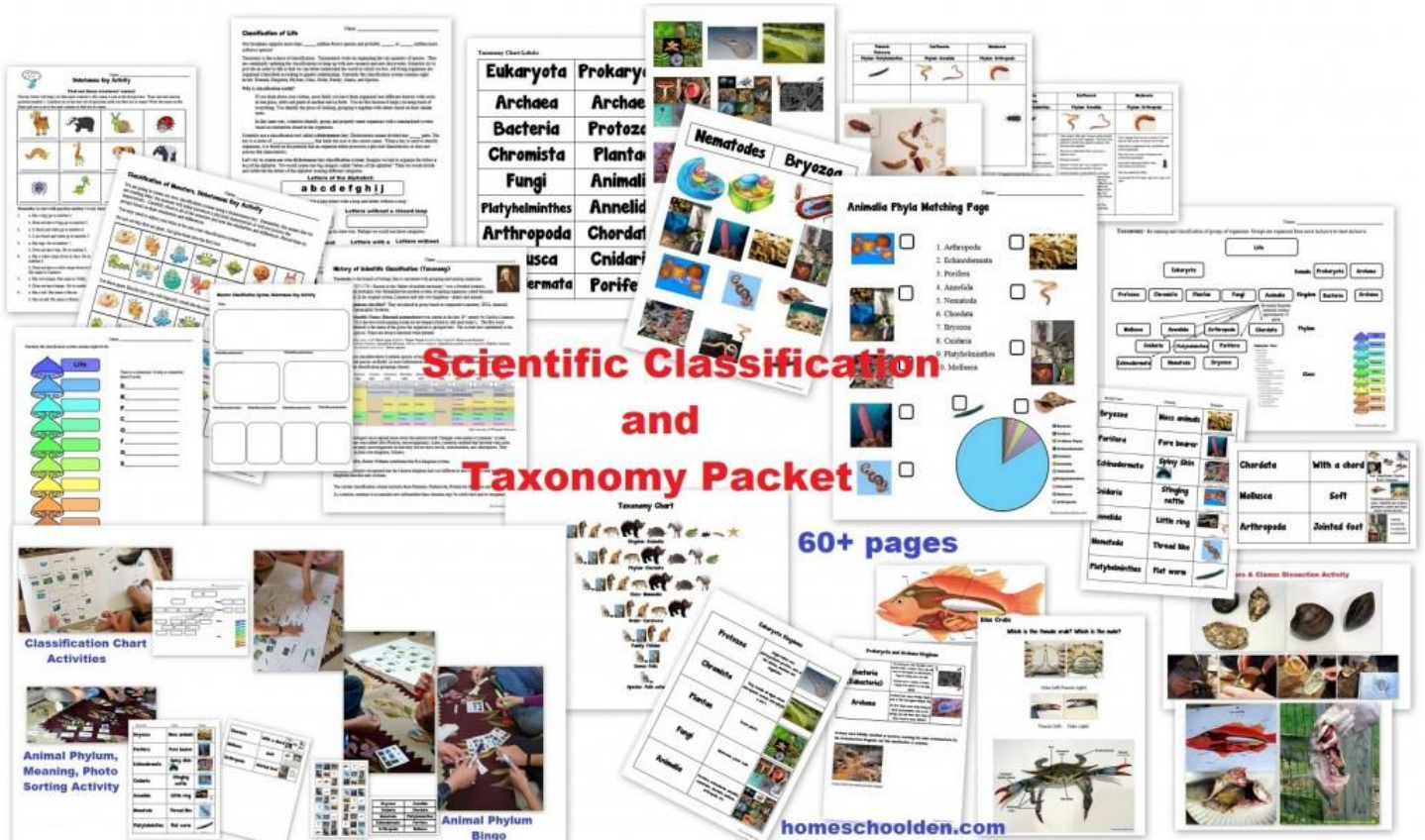
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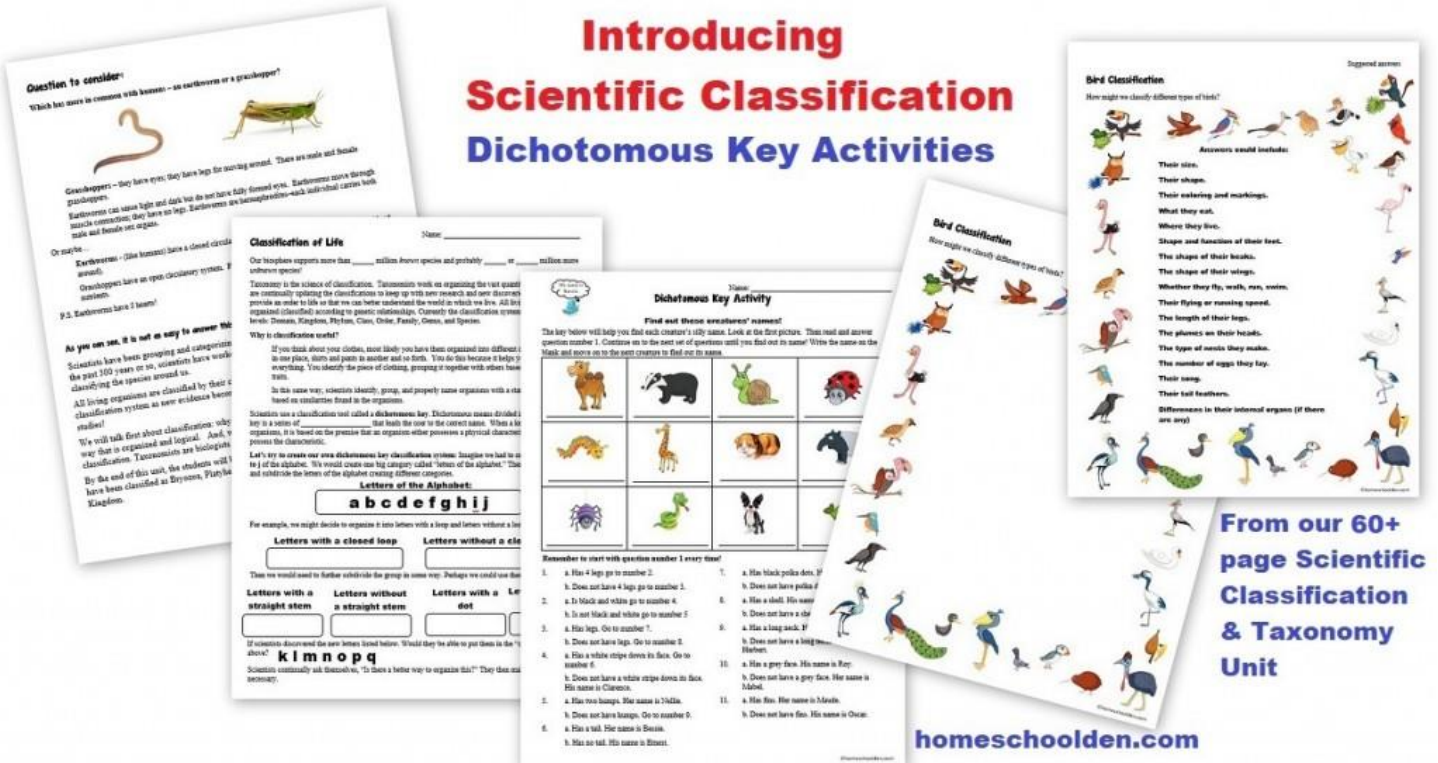
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Scientific Classification and Taxonomy Packet



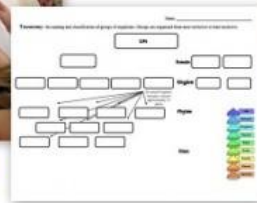
Introducing Scientific Classification Dichotomous Key Activities



Taxonomy & Scientific Classification Unit



**Classification Chart
Activities**



**Animal Phylum,
Meaning, Photo
Sorting Activity**

Phylum Name	Meaning	Example
Bryozoa	Mass animals	
Porifera	Pore bearer	
Echinodermata	Spiny Skin	
Cnidaria	Stinging nettle	
Annelida	Little ring	
Nematoda	Thread like	
Platyhelminthes	Flat worm	

Chordata	With a chord	
Mollusca	Soft	
Arthropoda	Jointed foot	



Bryozoa	Annelida
Cnidaria	Chordata
Nematoda	Platyhelminthes
Echinodermata	Porifera
Arthropoda	Mollusca



**Animal Phylum
Bingo**

World Facts Packet

Do your kids know the 4 largest countries? Which people? The longest river? This packet covers basic geography, it covers geographic features, landforms, world maps, and more! This packet also includes geographic facts, deserts of the world, topographic maps and more!



- *Largest countries
- *Population facts
- *Major world religions
- *Facts about the US:
 - largest/smallest state, capital,
 - highest mountain, longest
 - river, rivers & lakes sheet,
 - largest cities, neighbors
- *Blank fact sheet pages
- for: Canada, United Kingdom,
- Australia, South Africa
- *Famous world landmarks

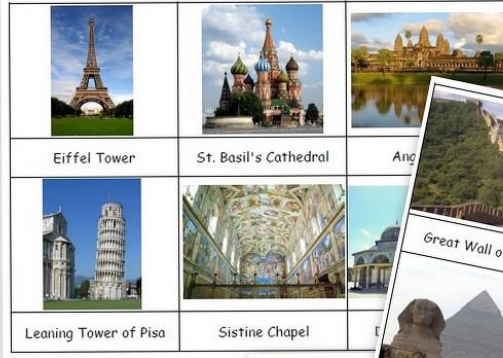


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World Facts Packet (cont.)

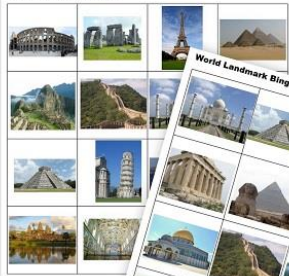
Can you identify these famous World Landmarks?

1. Eiffel Tower
2. Pyramids of Giza
3. Leaning tower of Pisa
4. St. Basil's Cathedral
5. Angkor Wat
6. Sistine Chapel
7. Dome of the Rock
8. Big Ben
9. Temple of the Emerald Buddha
10. Machu Picchu
11. Sydney Opera House
12. Parthenon
13. Colosseum
14. Taj Mahal
15. Great Wall of China
16. Stonehenge
17. Sphinx
18. Chichen Itza
19. Hagia Sophia
20. Palace of Versailles
21. Masjid al-Haram, Mecca
22. Moscow Kremlin



Famous World Landmarks

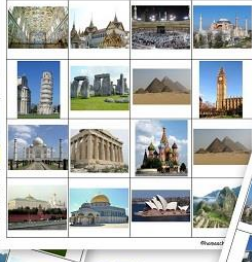
World Landmark Bingo 1



World Landmark Bingo 2



World Landmark Bingo 3



World Landmark Bingo 4

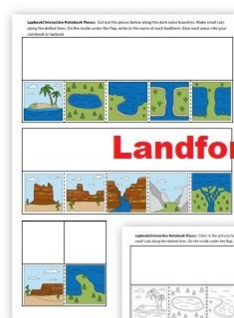


8 Bingo Cards

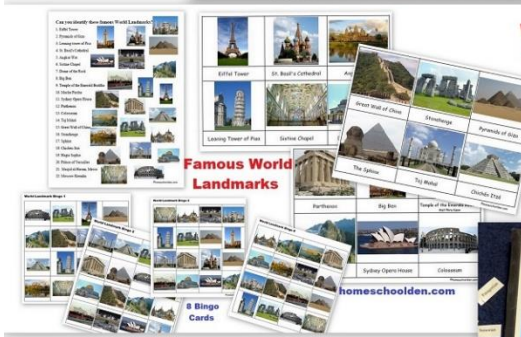
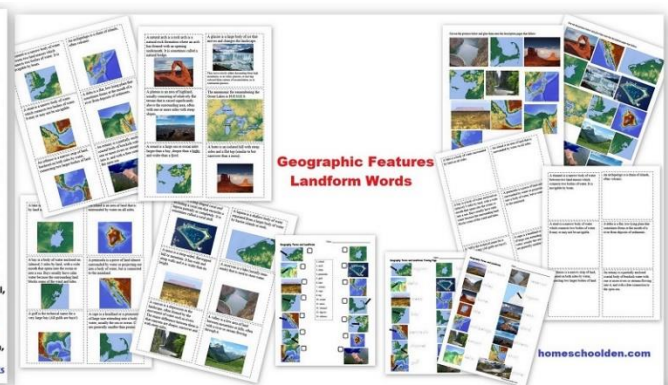
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Landform Activities

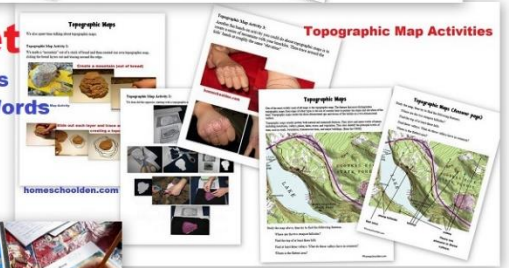


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World Facts Packet

- +World Fact Pages, USA Fact Pages
- +Geographic Features, Landform Words
- +World Landmarks
- +Deserts of the World
- +Topographic Map Activities



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