FUN WITH SCIENCE

WINTER BREAK ACTIVITIES

GRADES 3 - 5

Elementary Science

Department of K-12 Curriculum

FAIRGAME FOCUSED OPEN EDUCATION RESOURCES

DIGITAL RESOURCES:

Photosynthesis

http://studyjams.scholastic.com/studyjams/jams/science/plants/photosynthesis.htm

Plant Adaptations

http://studyjams.scholastic.com/studyjams/jams/science/plants/plant-adaptations.htm

http://www.mbgnet.net/bioplants/adapt.html

Plants with Seeds

http://studyjams.scholastic.com/studyjams/jams/science/plants/plant-with-seeds.htm

Understanding the Moon

https://youtu.be/2aFGNGEcDOk

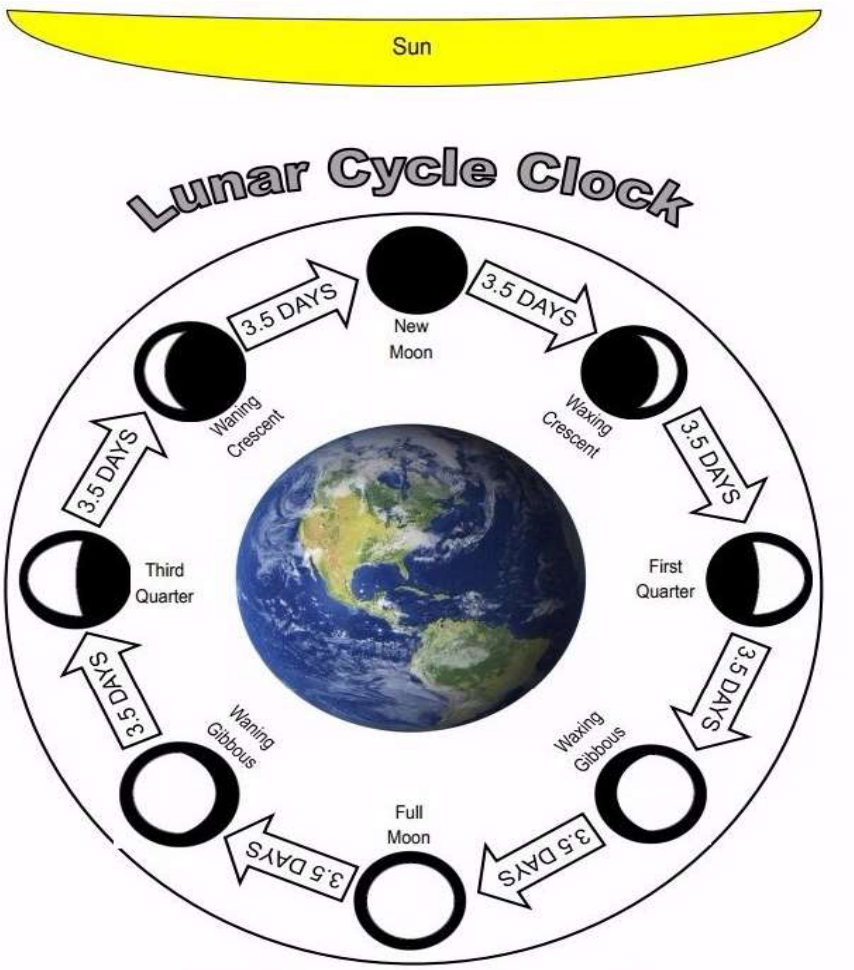
http://sciencenetlinks.com/media/filer/2011/10/14/moon_challenge.html

The Rock Cycle

http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/rock-cycle.htm

http://floridastudents.org/PreviewResource/StudentResource/166832

ACTIVITY:



Lunar Cycle Math: Use the Lunar Cycle Clock above to answer the questions below.

Jacob's teacher reads this rhyme about the months of the year to the class. "30 days has September, April, June and November. All the rest have 31, except February."

If November 1st is a New Moon, what phase of the moon will it be on November 16th?

A. Waxing Crescent
B. First Quarter
C. Waxing Gibbous
D. Full Moon

If December 1 is the first Full Moon of the winter--called the full cold moon--when is the next Full Moon?

A. December 3
B. December 25
C. December 28
D. December 31

Some plants owe their growth to these hard-working ants

By Los Angeles Times, adapted by Newsela staff on 12.01.16
Word Count **633**

Close-up of an ant on a plant. **Chris Ackermann**

Ants are amazing insects. They have been known to build rafts and bridges with their bodies. They have also been seen taking care of large gardens of fungus. They grow the fungus to eat.

Now, a new study suggests that some ants help grow plants, too. It says they have been have been farming plants for millions of years. That's longer than people. Experts think humans only started farming 23,000 years ago.

Guillaume Chomicki is a scientist who studies at the University of Munich in Germany. Chomicki did a study on ants in Fiji, an island nation in the South Pacific Ocean. He climbed high into the trees to observe ants. He discovered a special community of ants that actively grows six species, or types, of plants.

These Plants Welcome Ants

The plants the ants farm are all part of a group called Squamellaria. They are also known as "ant-plants." These plants grow on other plants, usually trees.

Chomicki's study was published Monday. It describes a hard-working species of ants. They are called Philidris nagasau. These ants are involved in almost every part of the life cycle of ant-plants.

Squamellaria plants grow fruit. It looks like a large avocado with tiny bumps all over it. Before the fruit is ready to eat, the ants start to gather its seeds. They cut through the fruit's skin to get the seeds. Next, the ants push the seeds into holes in the tree bark. Then they guard the seeds, waiting for them to sprout.

"Little House" Takes Shape

Soon, the seedlings develop a soft, round structure. This part of the plant sits between the roots and the stem. It is known as a domatium. That means " little house" in Latin.

When the domatium is big enough, the ants enter a hole in it to poop. This gives the young plant much needed fertilizer. Fertilizer is a material that helps plants grow. It contains nutrients the plant needs.

What do the ants get in return for all this hard work?

Most importantly, they get a place to live.

Home "Looks Like A Brain"

As the ant-plant continues to grow, its domatium grows, too. It can grow up to 8 to 16 inches across. Sometimes it gets even bigger. This structure makes a perfect home for ants, Chomicki said. Inside are many folds, spaces, and pathways. Chomicki said it "looks like a brain."

All those folds mean there's plenty of space for the ants to nest. That is good for the ants. It is good for the plant, too. The more ants that live in the domatium, the more ant-fertilizer the plant gets.

Some types of Squamellaria make things ever better for the ants. They drip delicious sugar from their leaves for the ants to eat.

Chomicki said every time he found this species of ants, they were living in one of the ant-plants that they farm. Also, he never saw the plants without the ants living in them. That suggests the plants and the ants need each other to survive, he said.

This is not the first time animals have been seen farming.

Sloths Welcome Algae

Three-toed sloths in Costa Rica encourage green algae to grow on their fur. The algae give them healthy nutrients the sloths do not get from their leafy diet.

Other types of ants have been known to farm and eat fungus. However, Chomicki said the ant farmers of Fiji are the first known ants to farm plants instead of fungus.

He added that there is still more he would like to learn about the relationship between the ant farmers and their crops. For example, he noticed that the ants only poop in certain holes in the domatium. He suspects that the plant makes a chemical that tells the ant where to poop.

Quiz

1 Read the first paragraph of the article.

> *Ants are amazing insects. They have been known to build rafts and bridges with their bodies. They have also been seen taking care of large gardens of fungus. They grow the fungus to eat.*

What does the author mean by calling ants "amazing"?

(A) They are not as interesting as other insects.

(B) They are not often seen working.

(C) They are beautiful insects to look at.

(D) They are able to do surprising things.

2 Read the sentence from the section "These Plants Welcome Ants."

> *The plants the ants farm are all part of a group called Squamellaria. They are also known as "ant-plants."*

Based on the article, what does "ant-plants" refer to in the sentence?

(A) plants fertilized by ants so they can eat them

(B) plants that show ants the best trees to find food

(C) plants grown by ants so they can live inside

(D) plants that ants find and then live inside

3 How does the section "Home Looks Like A Brain" support a MAIN idea of the article?

(A) by showing how the ants plant seeds in the bark of trees

(B) by showing how the ants and the plants help each other

(C) by explaining the size and shape of the domatium

(D) by explaining the places Chomicki looks for ants

4 Which sentence from the article would be MOST important to include in a summary?

(A) They have been known to build rafts and bridges with their bodies.

(B) He discovered a special community of ants that actively grows six species, or types, of plants.

(C) Before the fruit is ready to eat, the ants start to gather its seeds.

(D) He added that there is still more he would like to learn about the relationship between the ant farmers and their crops.

PHYSICAL SCIENCE OPEN EDUCATION RESOURCES

DIGITAL RESOURCES:

Physical & Chemical Changes of Matter

http://studyjams.scholastic.com/studyjams/jams/science/matter/changes-of-matter.htm

Energy & Matter

http://studyjams.scholastic.com/studyjams/jams/science/matter/energy-and-matter.htm

Properties of Matter

http://studyjams.scholastic.com/studyjams/jams/science/matter/properties-of-matter.htm

Light Bends (Refraction)

https://www.youtube.com/watch?v=Aggi0g67uXM

Separating Mixtures

http://studyjams.scholastic.com/studyjams/jams/science/matter/mixtures.htm

http://www.cpalms.org/Public/PreviewResourceStudentTutorial/Preview/113196

ACTIVITY:

Physical and Chemical Changes in Pancakes
ADULT SUPERVISION IS REQUIRED

I. **Purpose:** Students will be able to distinguish between physical and chemical properties, and physical and chemical changes. Students will follow the scientific method during scientific inquiry, documenting collected data.

II. **Hypothesis:** If _____, then _____.

III. **Materials:** Complete pancake mix, water, vegetable oil or cooking spray, maple syrup, mixing bowl, spatula, whisk, electric griddle, plates, forks, measuring cup, chocolate chips (optional)

IV. **Procedure:**
1. Obtain batter and supplies
2. Preheat griddle to 400°F, and add oil/cooking spray
3. Measure the pancake mix into the bowl according to the directions, and stir into a batter
4. When a drop of water "dances" on griddle, pour ½ cup of batter onto the griddle
5. Flip pancake over when bubbles appear around the edges
6. Cook for about 30 seconds
7. Remove pancake from heat, and enjoy
8. Repeat steps 4-7 until all batter is used
9. Complete data table and conclusion
10. Clean up

V. **Data:** Check the type of change observed (one check per row)

	PHYSICAL CHANGE	CHEMICAL CHANGE
Opening box of mix		
Adding mix to bowl		
Adding water to mix		
Stirring the mix		
Heating the griddle		
Pouring batter onto griddle		
Cooking the pancake		
Adding syrup to pancake		
Eating the pancake		

VI. **Conclusion**: The hypothesis was if _____,

then _____.

The hypothesis was _____ (correct or incorrect?). List 3 scientific principles learned from this lab:

_____

_____

_____

List 3 things the scientist would change to make the lab more educational (eating more pancakes is not acceptable).

_____

_____

_____

Matter and Energy: Evaporation and condensation

By Encyclopaedia Britannica, adapted by Newsela staff on 06.02.17
Word Count **488**
Level **670L**

Condensation on a cold bottle of water. Condensation is when a gas becomes a liquid. It happens when a gas, like water vapor, cools down. Photo from: Wikimedia Commons.

Matter can exist in three different states. These states are solid, liquid and gas. Matter can change from one state to another through different processes, such as evaporation and condensation. In evaporation, matter changes from a liquid to a gas. In condensation, matter changes from a gas to a liquid.

All matter is made of tiny moving particles called molecules. Evaporation and condensation happen when these molecules gain or lose energy. This energy takes the form of heat.

Evaporation

Evaporation happens when a liquid is heated. For example, the sun heating the water in a puddle causes the puddle to shrink. The water seems to disappear. However, it actually moves into the air as a gas. The gas is called water vapor. This is an example of evaporation.

All molecules in a liquid move. Some move faster than others, though. As the molecules at the surface of a liquid gain heat, they move around more quickly. This gives them more energy. Eventually they have enough energy to break away from other water molecules. When the molecules are moving fast enough, they are able to "escape." They leave the surface of the liquid as gas molecules.

Evaporation Versus Boiling

Evaporation is not the only process that can change something from a liquid to a gas. The same change can happen through boiling. As a liquid is heated, its molecules gain heat. They move faster and faster. When the liquid starts to boil, bubbles of vapor form within the liquid. Then they rise to the surface. The temperature that causes this to happen is known as the boiling point of a liquid.

There are two key differences between evaporation and boiling. The first difference is where the change of state happens. Evaporation takes place only at the surface of a liquid. But boiling can happen anywhere within the liquid. In boiling, the change of state takes place at any point where bubbles form.

The second difference between evaporation and boiling has to do with temperature. Evaporation can take place at any temperature. For example, a puddle of water will evaporate on a cold day. However, boiling only happens at the boiling point of a liquid.

Condensation

An example of condensation is when drops of water form on the outside of a cold glass. The drops seem to appear from nowhere. However, they actually form from water vapor in the air. The dew that forms on grass overnight is another example of condensation.

Condensation happens when molecules in a gas cool down. As the molecules lose heat, they lose energy and slow down. They move closer to other gas molecules. Finally these molecules collect together to form a liquid.

Quiz

1 Which selection from the article BEST explains how matter changes states?

(A) Matter can change from one state to another through different processes, such as evaporation and condensation.

(B) Evaporation and condensation happen when these molecules gain or lose energy.

(C) Evaporation is not the only process that can change something from a liquid to a gas.

(D) Condensation happens when molecules in a gas cool down. As the molecules lose heat, they lose energy and slow down.

2 According to the section "Evaporation," what happens to molecules when a liquid is heated?

(A) The molecules look like they disappear.

(B) The molecules slow down and leave the surface of the liquid.

(C) The molecules turn into a gas called water vapor.

(D) The molecules will turn into bubbles and rise to the surface.

Family Science Adventure

Field Research Ranger Program

Parents of Palm Beach County,

The Science Department of Palm Beach County School District has teamed up with R.I.S.E. Organizations (Resources in Science Education) to offer your child an adventure in learning and exploration they will remember for a life-time! This program will take them into the great outdoors with family and friends and offers your child the opportunity to become an official Field Research Ranger of the Palm Beach County School District. To become a Field Research Ranger your child must follow these steps:

1. Visit each participating RISE organization

2. Complete the on-site Field Research Ranger activity

3. Bring the completed passport booklet to the district office to receive their certification and FRR patch.

This learning adventure is **FREE** for participating students, however, some participating state parks may require a minimal entrance fee that can not be waived according to policies set forth by the state.
By completing the Field Research Ranger certification process your child will experience nature walks, scavenger hunts, geocaching, and a variety of other hands-on learning activities supporting science and the discovery of Florida's natural resources and unique ecosystems. This opportunity has no time restriction and is available year-round so it can be a great weekend activity during the school year or a summer-long adventure.

***The passport booklet is available following this link: https://www.palmbeachschools.org/ec/science/ and can also be picked up at participating organizations and schools throughout the district. If you have questions or concerns about this program please email Tom Salinsky at thomas.salinsky@palmbeachschools.org.**

Participating RISE Organizations:	Expected Fees:
FAU/Pine Jog Environmental Center	00.00
Gumbo Limbo Nature Center	00.00
Loggerhead Marinelife Center	00.00
River Center-Loxahatchee River District	00.00
Grassy Waters Preserve	00.00
Green Cay Nature Center	00.00
Okeeheelee Nature Center	00.00
Daggerwing Nature Center	00.00
Manatee Lagoon- An FPL Eco-Discovery Center	00.00
Jupiter Inlet Lighthouse Outstanding Natural Area	00.00
Arthur R. Marshall Foundation	$5.00 car entry fee
John D. MacArthur Beach State Park	$5.00 car entry fee
Palm Beach Maritime Museum & Academy	Ferry Fees to Peanut Island
Sandoway House Nature Center	Free to participating student (adults pay)
Lion Country Safari	Free to participating student (adults pay)
South Florida Science Center and Aquarium	Free to participating student (adults pay)
Palm Beach Zoo	Free to participating student (adults pay)

**75% or more of the RISE activities must be completed (logos stamped) to receive certification and the official Field Research Ranger patch.*