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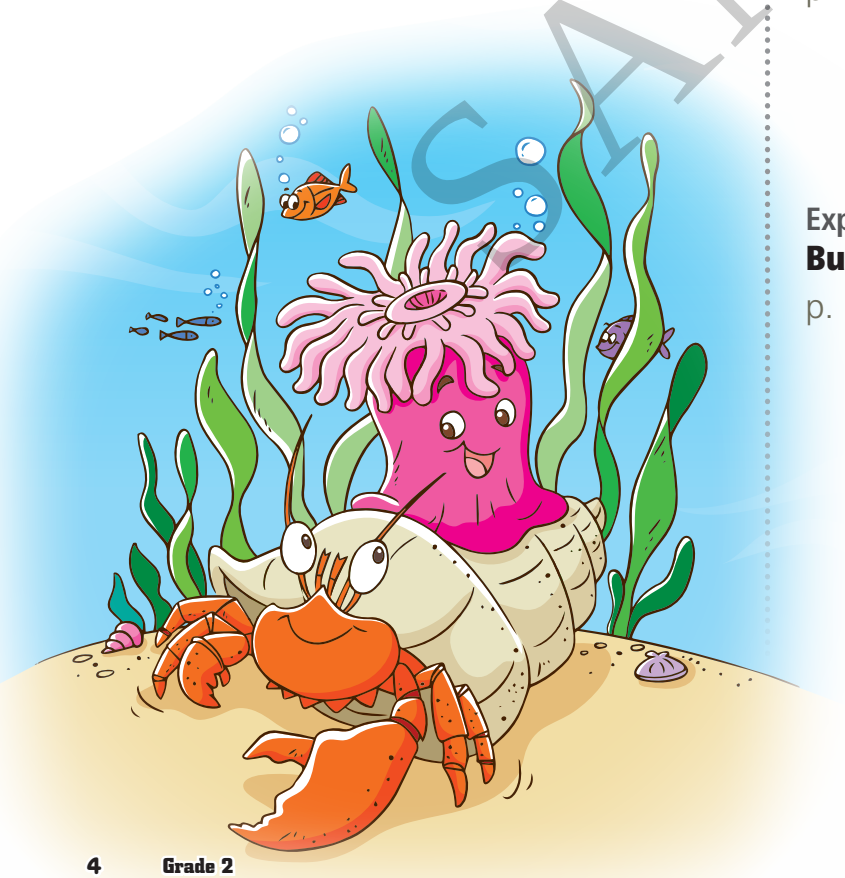

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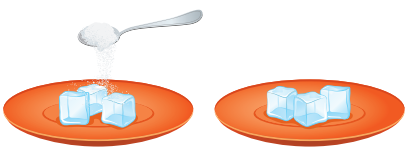
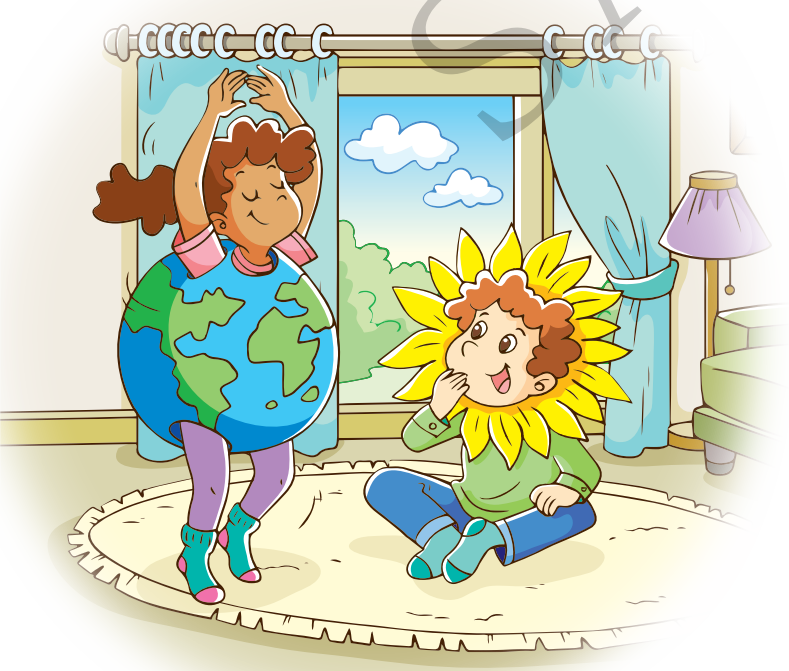






## Basic Science Concepts





## STEM Experiments

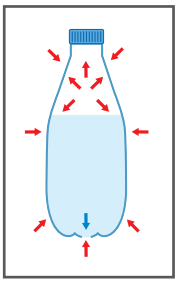












# 3 Animals – Growth and Changes

All animals change as they grow. In this unit, you will relate young animals to their parents, noting that some look alike and some do not. You will also examine changes in animals as they grow.

*We all look like our parents.*

**After completing this unit, you will**

- know what some animals look like at different stages.
- understand that animals can go through many changes.



## Vocabulary

**reproduce:** produce young living things

**egg:** laid by animals; some have hard shells like chicken eggs and some have soft shells like frog eggs

**live young:** a baby animal that does not hatch from an egg

*My baby sister is an example of a live young.*

## Extension

*Find pictures of yourself taken at different ages. Place them side by side, starting with the one taken when you were youngest. Take a close look at your facial features in the pictures. Can you see how you have changed as you grew? Ask your parents to show you pictures taken when they were your age. Put their pictures and your pictures side by side to see how much you look like your parents.*

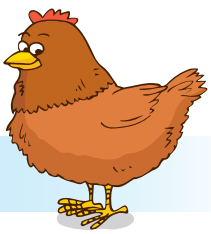

**A. Number the pictures from 1 to 3 to show the order of growth.**

1.

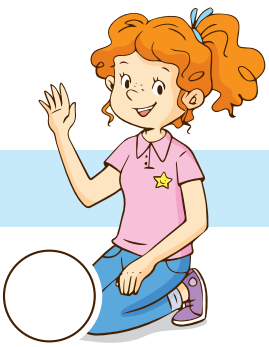


2.





3.


**B. Match the adult animals with their young. Write their names on the lines.**

**Adult**

zebra bear ladybug frog seal

**Young**


tadpole


foal


cub


pup


nymph

1.  _____ and _____

2.  _____ and _____

3.  _____ and _____

4.  _____ and _____

5.  _____ and _____

**C. Answer the questions. Give examples of animals that are not mentioned in Part B as your answers.**

1. Name two animals whose young are called cubs.

_____

2. Name one baby animal that looks like its parents.

_____

**D. Name the animals using the given clues.**

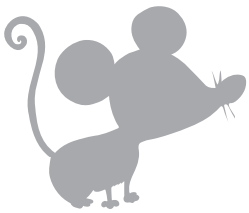
**mouse butterfly duck frog**

1. 

*I was a caterpillar.*

2. 

*I hatched from an egg in a nest.*

3. 

*I wasn't born as an egg but was a live young.*

4. 

*My tail slowly disappeared as I grew up.*

# WATER IN LAYERS

## understanding how the density of water and temperature are related

Building layer cakes is fun and simple. All you have to do is start with a layer of cake and add a layer of frosting alternately. It is easy to layer solids, but how about liquids? Is it possible to create layers with liquid water? Try the experiment to see.

**What you need:**


red and blue food coloring


2 small identical jars


water


a baking sheet


a thin piece of cardboard

The cardboard must be larger than the openings of the jars.

**STEM Note**

Density is a measure of how tightly packed something is, which helps us find out if something feels heavy or light for its size.


**CAUTION!**
Ask an adult for help with hot water.


**Difficulty:**

**Time needed:**
1 hour

In this experiment, you will learn that temperature affects the density of water.



**What to do:**

1. Fill one jar with cold water and add a few drops of the blue food coloring.
2. With the help of an adult, fill the other jar with hot tap water and add a few drops of the red food coloring.
3. Put both jars of water on the baking sheet.
4. Cover the opening of the red jar with the cardboard.
5. While holding the red jar and cardboard in place, carefully turn the red jar upside down and rest it onto the blue jar to avoid spilling any water as shown in Setup 1.
6. Have someone hold onto both jars while you slowly and carefully pull out the cardboard. Then observe.
7. Repeat Steps 1 to 6 but place the blue jar onto the red jar instead as shown in Setup 2.

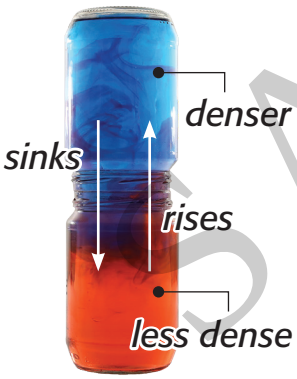
## WHAT *just* happened?

When water is heated, it expands and becomes less dense. Therefore, hotter water tends to rise while colder, denser water sinks.

**Setup 1**


For Setup 1, you should have noticed that no mixing happened – both layers of colored water stayed where they were with hot red water floating over the cold blue water. This is because the hot water was less dense, so it stayed on top.

**Setup 2**




Conversely, mixing happened instantly and created purple water in Setup 2. This is because the hot red water was less dense and rose while the cold blue water was denser and sank.

# STEM INQUIRY

- What is the purpose of using different colors for each jar?
- If you leave the hot water and cold water from Setup 1 out for longer, do you think they will eventually mix together?
- In Setup 2, do you think the mixing will be more or less obvious if the cold water is colder and the hot water is hotter?

- Are there energy-efficient technologies or systems that can optimize the heating or cooling process?

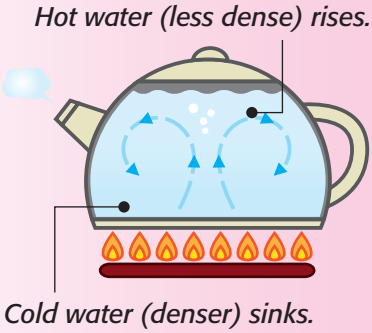
- How can we change the cardboard to make a better seal between the two jars?

- If the hot water from the tap is at 113˚F (45˚C) and the cold water is at 59˚F (15˚C), what do you think the approximate temperature will be when they are fully mixed together?



Fun to know

## How Water Boils




At first glance, you might think that the water in a kettle is sitting idle as it is being heated but, in fact, it is constantly on the move! The water at the bottom of the kettle is closer to the cooktop, so it heats up faster than the water at the top. As the water gets hotter and less dense, it rises to the top, while the now cooler water at the top sinks to the bottom. So rather than sitting idle, water in a kettle is in a cycle of rising and sinking as it reaches its boiling point.