

## ***STUDENT SAMPLE LEVEL 2***

### **Drawings by the Sun Activity 3**

Did you know the sun can paint pictures? With special paper, it can!



Sun print paper is treated with special chemicals that allow the sun to **react** to the paper. But will other lights work as well?

### **Investigate!**

**Lab 1 will use a 15 watt bulb as light source.**

1. In an area where the paper will not be disturbed or windblown, lay objects on sun paper. Papers may also be laid on a cardboard lid and the objects pinned to the paper.

2. Place the papers directly under the lamp and wait fifteen minutes.

3. Remove one of the objects from the paper. Is the color of the paper lighter or darker under the object? \_\_\_\_\_

4. Put object back on paper and wait fifteen minutes longer.

Remove the object again. With more time under the light, is the imprint lighter or darker? \_\_\_\_\_

5. When satisfied with the print, remove all objects. The teacher will soak the paper in water for about one minute.

6. What happens? \_\_\_\_\_

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**Lab 2 will use a 100 watt bulb as light source.**

1. In an area where the paper will not be disturbed or windblown, lay objects on sun paper. Papers may also be put on a cardboard lid and the objects pinned to the paper.
2. Place the papers directly under the lamp and wait fifteen minutes.
3. Remove one of the objects from the paper. Is the color of the paper lighter or darker under the object? \_\_\_\_\_
4. Put the object back on the paper and wait fifteen minutes longer. Remove the object again. With more light, is the imprint lighter or darker? \_\_\_\_\_

5. When satisfied with the print, remove all objects. The teacher will soak the paper in water for about one minute.

6. What happens? \_\_\_\_\_

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*Did you know?*

**Sheep have four stomachs!**

**Some kinds of sharks lay the biggest eggs in the world!**

***And those are science facts!***

**Lab 3 will use the sun as light source.**

1. In an area where the paper will not be disturbed or windblown, lay objects on sun paper. Papers may also be laid on a cardboard lid and the objects pinned to the paper.
2. Place the papers directly in the sun and wait fifteen minutes.
3. Remove one of the objects from the paper. Is the color of the paper lighter or darker under the object? \_\_\_\_\_
4. Put the object back on paper and wait fifteen minutes longer.

Remove the object again. With more light, is the imprint lighter or darker? \_\_\_\_\_

5. When satisfied with the print, remove all objects. The teacher will soak the paper in water for about one minute.

6. What happens? \_\_\_\_\_  
\_\_\_\_\_

When all of the papers have been soaked in water, lay the papers flat to dry. As the papers dry, the image will become clearer.



Why does the paper make pictures from the light? The paper is coated with a chemical that reacts to light!

Objects **blocked** the light energy and the paper turned white. But the paper in the sun stayed blue! Adding water stopped the chemical process. This made the image freeze on the paper.

## Is That Iron In My Cereal? Activity 5

We know magnets are attracted to **iron**. Iron is an important **mineral** for growing bodies.

Iron is a part of **all** cells. Iron helps carry oxygen from the lungs to the **whole** body. Without iron, the body can't make enough red blood cells. People that don't get enough iron are said to be **anemic**.

*To help people get more iron in their diets, companies put iron in some cereals. Is this the same iron that is attracted to a magnet?*



### Investigate!

#### Student Materials

- Bar Magnet
- Mortar And Pestle

## Student Instruction

1. Grind a handful of cereal with the mortar and pestle.
  2. Using the bar magnet, drag it slowly through the cereal.
  3. What do you see attached to the magnet? \_\_\_\_\_
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## Separate or Mixed? Activity 6

Can magnets be used to separate mixtures?

Salt is hard kernels that have a gritty texture. Cornstarch is a soft, fine powder. Will a magnets pull work the same with both salt and cornstarch?

**Investigate!**

### Student Material

- Bar Magnet





## Student Instruction

1. In a sandwich baggie, place one tablespoon of salt and one tablespoon of iron filings.

2. Seal the bag tightly and shake.

3. What is the color of the mixture? \_\_\_\_\_

4. Open the bag and drag the bar magnet **through** the mixture.

The iron filings separate from the salt and attach to the magnet. Lift out the magnet and carefully scrape the filings into a dish and cover.

5. When the magnet has attracted one tablespoon of the filings, look at the remaining salt.

6. What is the color now? \_\_\_\_\_

7. In a sandwich baggie, place one tablespoon of the cornstarch and one tablespoon of iron filings. Seal the bag and shake.

8. What is the color of the mixture? \_\_\_\_\_

9. Open the bag and drag the bar magnet **through** the mixture.

The iron filings separate from the corn starch and attach to the magnet. Lift out the magnet and carefully scrape the filings into a dish and cover.

10. When the magnet has attracted one tablespoon of the filings, look at the remaining corn starch.

11. What is the color now? \_\_\_\_\_

12. Was there any difference in the magnet's pull between the salt and the cornstarch? \_\_\_\_\_

13. Why? \_\_\_\_\_

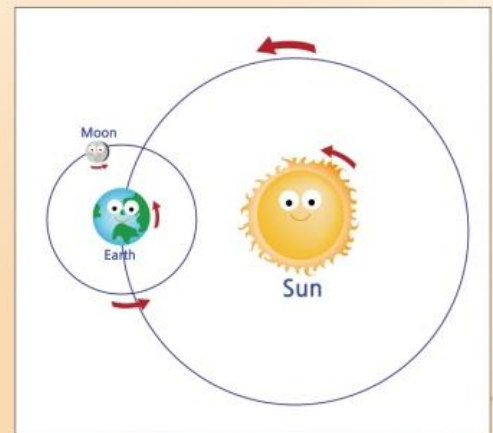
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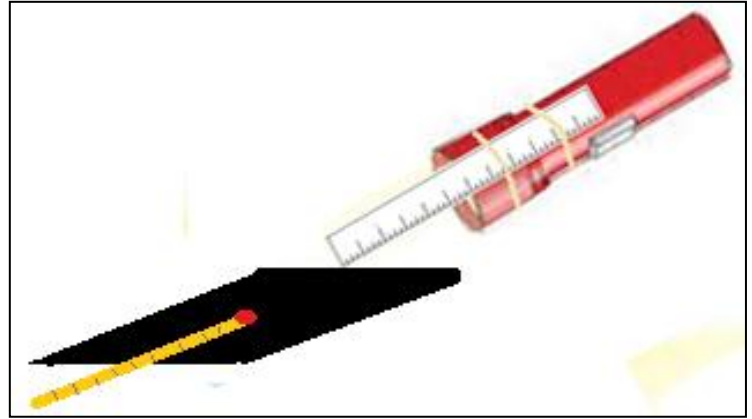
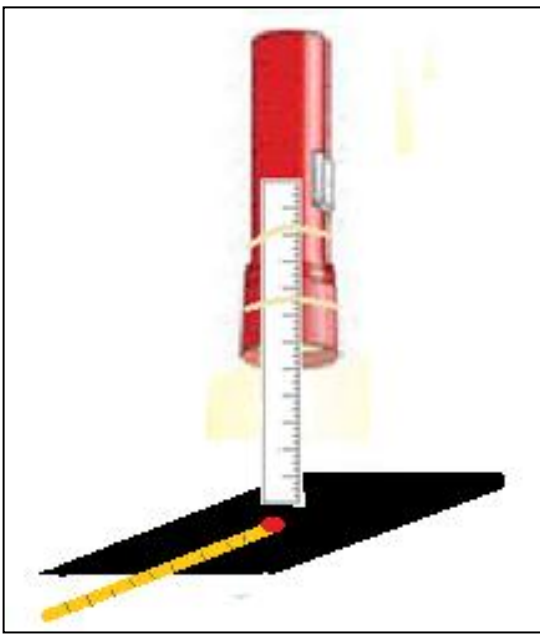
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## It Is Getting Hotter! Activity 2

We know earth's rotation makes day and night. But how does earth's tilt affect temperature? **Investigate! Experiment before going further.**

### ■ The Earth's Rotation





	<b>Beginning Temperature</b>	<b>Ending Temperature</b>
<b>Flashlight shining directly</b>		
<b>Flashlight shining at an angle</b>		

Which temperature was the highest? The one where the light was shining directly or the angled light? The temperature was the highest when the light was directly over the thermometer!

When the flashlight was moved to the side, the light was not as hot. The temperature did not rise as high.

What would happen if earth did not tilt? The sun would always shine directly on the **center** of earth as it rotates. The whole earth from the North Pole to the South Pole would always receive sunlight. There would be no seasons.

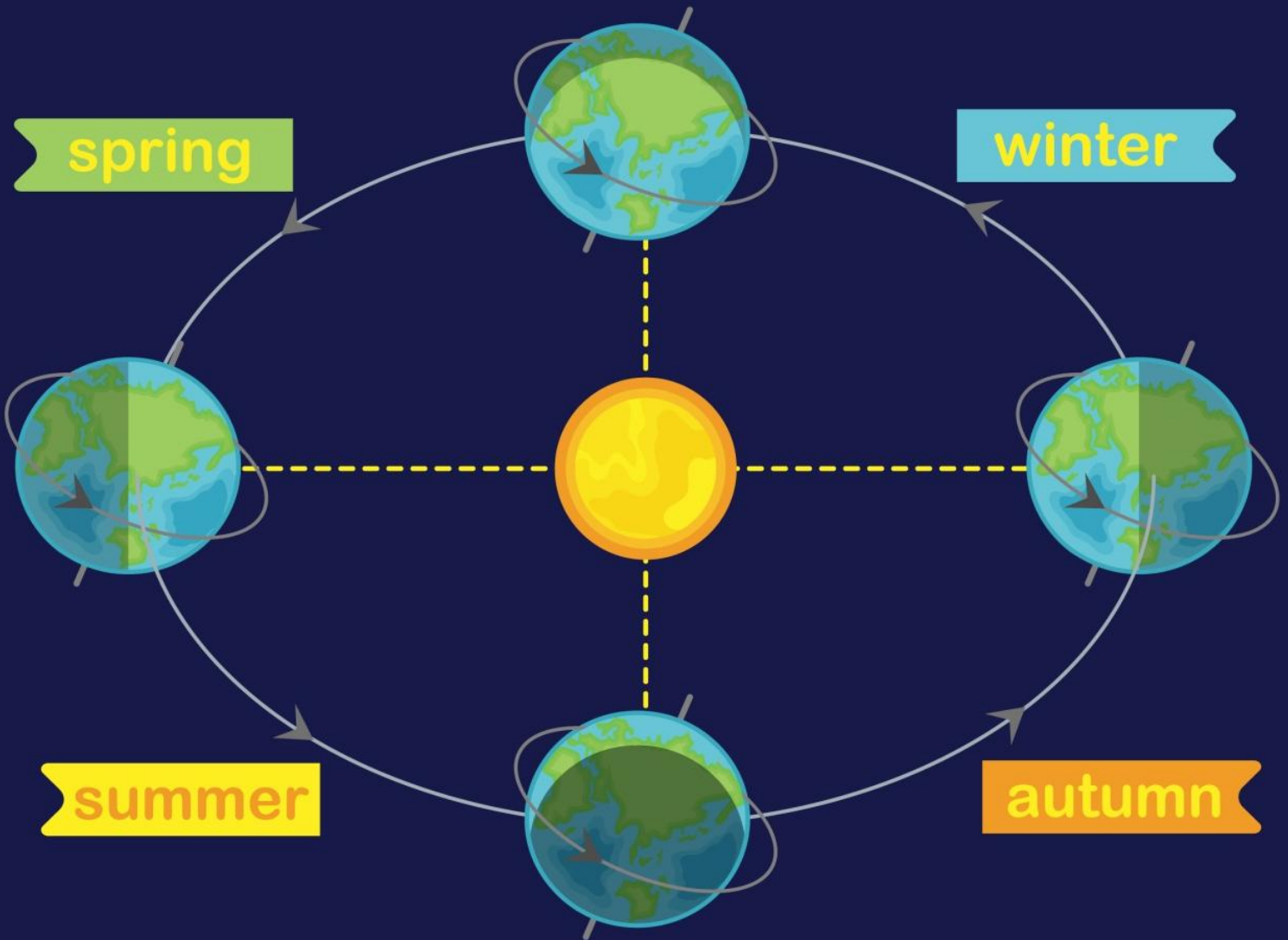
But earth does tilt. Why do spring and fall occur? Also because of earth's rotation!

Each season lasts about three months. It takes earth **twelve months, or one year, to revolve completely around the sun.**

As earth revolves around the sun, the angle of the sun makes the surface warmer or colder. This causes the four seasons: spring, summer, fall, and winter.

Study the different seasons.

# Seasons change



## TEACHER SAMPLE LEVEL 2

### Drawings by the Sun Activity 3 Student Workbook Page 47

Did you know the sun can paint pictures? With special paper it can!

Sun print paper is treated with special chemicals that allow the sun to **react** to the paper. But will other lights work as well? **Investigate!**



#### Teacher Materials

- **SUN PRINT PAPER , 4x4**
- **LAMP W/ 15 AND 100 WATT BULBS**
- **VARIOUS ITEMS FOR STUDENTS TO PUT ON PAPER**

**TEACHER PROCEDURE:** *These labs may be rotated through or by dividing students into 3 different groups where everyone will have paper and only the light source will change. Be sure to assist with the acrylic overlay included w/ the sun print paper as it will help items lay flat. Answers will vary according to light source and intensity.*

#### Lab 1 will use a 15 watt bulb as light source.

1. In an area where the paper will not be disturbed or windblown, lay objects on sun paper. Papers may also be laid on a cardboard lid and the objects pinned to the paper.
2. Place the papers directly under the lamp and wait 15 minutes.
3. Remove one of the objects from the paper. Is the color of the paper lighter or darker under the object? \_\_\_\_\_
4. Put object back on paper and wait 15 minutes longer. Remove the object again. With more time under the light, is the imprint lighter or darker? \_\_\_\_\_
5. When satisfied with the print, remove all objects. The teacher will soak the paper in water for about 1 minute.
6. What happens? \_\_\_\_\_

**Lab 2 will use a 100 watt bulb as light source.**

1. In an area where the paper will not be disturbed or windblown, lay objects on sun paper. Papers may also be put on a cardboard lid and the objects pinned to the paper.
2. Place the papers directly under the lamp and wait 15 minutes.
3. Remove one of the objects from the paper. Is the color of the paper lighter or darker under the object? \_\_\_\_\_
4. Put the object back on the paper and wait fifteen minutes longer. Remove the object again. With more light, is the imprint lighter or darker? \_\_\_\_\_
5. When satisfied with the print, remove all objects. The teacher will soak the paper in water for about 1 minute.
6. What happens? \_\_\_\_\_

**Lab 3 will use the sun as light source.**

1. In an area where the paper will not be disturbed or windblown, lay objects on sun paper. Papers may also be laid on a cardboard lid and the objects pinned to the paper.
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When all of the papers have been soaked in water, lay the papers flat to dry. As the papers dry, the image will become clearer.

Why does the paper make pictures from the light? The paper is coated with a chemical that reacts to light!

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## Is That Iron In My Cereal? Activity 5

### Student Workbook Page 131

We know magnets are attracted to **iron**. Iron is an important **mineral** for growing bodies.

Iron is a part of **all** cells. Iron helps carry oxygen from the lungs to the **whole** body. Without iron, the body can't make enough red blood cells. People that don't get enough iron are said to be **anemic**.

*To help people get more iron in their diets, companies put iron in some cereals. Is this the same iron that is attracted to a magnet?*

**Investigate!**

#### Teacher Material

- **CEREAL WITH ADDED IRON**

#### Student Materials

- **BAR MAGNET**
- **MORTAR AND PESTLE**



#### Student Instruction

1. Grind a handful of cereal with the mortar and pestle.
2. Using the bar magnet, drag it slowly through the cereal.
3. What do you see attached to the magnet? **TINY SLIVERS OF IRON FILINGS.**

## Separate or Mixed? Activity 6

### Student Workbook Page 132

Can magnets be used to separate mixtures?

Salt is hard kernels that have a gritty texture. Cornstarch is a soft, fine powder. Will a magnet pull work the same with both salt and cornstarch? **Investigate!**

#### Teacher Materials

- **IRON FILINGS**
- **SANDWICH BAG**
- **SALT**
- **CORNSTARCH**

#### Student Material

- **BAR MAGNET**



## Student Instruction

1. In a sandwich baggie, place one tablespoon of salt and one tablespoon of iron filings.
2. Seal the bag tightly and shake.
3. What is the color of the mixture? **WHITE AND GREY OR BLACK.**
4. Open the bag and drag the bar magnet **through** the mixture. The iron filings separate from the salt and attach to the magnet. Lift out the magnet and carefully scrape the filings into a dish and cover.
5. When the magnet has attracted one tablespoon of the filings, look at the remaining salt.
6. What is the color now? **THE SALT IS WHITE WITH NO MORE BLACK.**
7. In a sandwich baggie, place one tablespoon of the cornstarch and one tablespoon of iron filings. Seal the bag tightly and shake.
8. What is the color of the mixture? **WHITE AND GREY OR BLACK.**
9. Open the bag and drag the bar magnet **through** the mixture. The iron filings separate from the corn starch and attach to the magnet. Lift out the magnet and carefully scrape the filings into a dish and cover.
10. When the magnet has attracted one tablespoon of the filings, look at the remaining corn starch.
11. What is the color now? **THE CORNSTARCH IS WHITE WITH NO MORE BLACK.**
12. Was there any difference in the magnets pull between the salt and the cornstarch? **NO. THE MAGNETS ATTRACTED THE IRON FILINGS EQUALLY WELL IN BOTH SUBSTANCES.**
13. Why? **MAGNETS ARE ATTRACTED TO IRON METAL. IT DOESN'T MAKE ANY DIFFERENCE WHAT ELSE IT MAY BE MIXED WITH. MAGNETS WILL ALWAYS BE ATTRACTED TO IRON.**

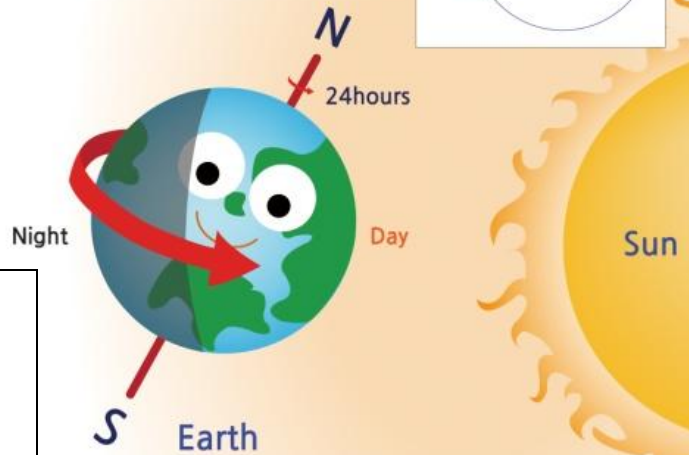
## ■ The Earth's Rotation

### It Is Getting Hotter! Activity 2 Student Workbook Page 191

We know earth's rotation makes day and night. But how does earth's tilt affect temperature? **Investigate! Experiment before going further.**

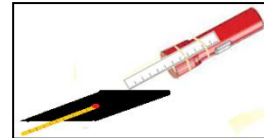
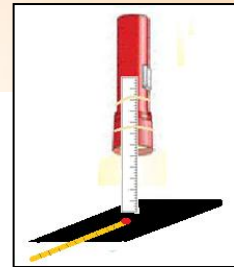
#### Teacher Materials

- THERMOMETER, PARTIAL IMMERSION
- FLASHLIGHT
- BLACK PAPER
- RULER
- RUBBER BANDS



#### TEACHER PROCEDURE

1. Fasten the rubber band to the flashlight so that 10 centimeters of the ruler show past the flashlight's edge.
2. Lay the thermometer on the black paper and record temperature.
3. Use the ruler to keep light 10cm from thermometer while shining light directly on the thermometer.
4. Wait 10 minutes. Record temperature.
5. Allow the thermometer to return to room temperature.
6. Repeat but this time hold the flashlight at a 45 degree angle from the thermometer. Make sure the distance to the light is still 10 centimeters.
7. Wait 10 minutes. Record temperature.



	Beginning Temperature	Ending Temperature
Flashlight shining directly		
Flashlight shining at an angle		

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