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SCHOOLS

# Science Learning Packet

## Grade 6:

# Weather Patterns, Lesson 6

science learning activities for SPS students during the COVID-19 school closure.

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Due to the COVID-19 closure, teachers were asked to provide packets of home activities. This is not intended to take the place of regular classroom instruction but will help supplement student learning and provide opportunities for student learning while they are absent from school. Assignments are not required or graded. Because of the unprecedented nature of this health crisis and the District's swift closure, some home activities may not be accessible.

If you have difficulty accessing the material or have any questions, please contact your student's teacher.



**Grade 6 Science Learning Activity**  
**Weather Patterns Unit Instructional Materials**  
**Lesson 6\***

AmplifyScience



# Weather Patterns

*\*Amplify Chapter 2, 2.1*

Student Name: \_\_\_\_\_

School: \_\_\_\_\_ Grade: \_\_\_\_\_

Science Teacher: \_\_\_\_\_

Date: \_\_\_\_\_

Hello Families,

We hope you and your family are well and safe during this time. During this unprecedented out-of-school time, the SPS middle school science team will be offering instructional opportunities for students that align with the district's adopted middle school science instructional materials.

This investigation packet is part of a series of district-aligned lessons about **Weather Patterns, a 6th grade life science unit developed by AmplifyScience** and adopted by SPS in 2019. While Amplify Science lessons are designed to be done in the classroom with peers, there are some activities that students can complete at home. In this packet you will find activities to accompany lessons in the unit. **Accompanying lesson videos are posted on the [SPS Science webpage](#) under Grade 6.** These lesson videos, developed in collaboration between SPS teachers, Denver Public Schools teachers, and Amplify Science, feature teachers going through the information in the lessons. **The work in this packet is intended to be completed alongside the viewing of the video of the corresponding videos.**

**To find the correct lesson videos:**

- Go to [SPS Science webpage](#)
- Scroll to "6<sup>th</sup> Grade"
- Find the "Weather Patterns" videos section
- Select the video that matches the lesson you are completing that day.

For students who have access to the internet and the following devices and browsers **may wish to log-in to their AmplifyScience account from home are welcome to do so.** Chrome and Safari are the recommended browsers to use for full functionality of the Amplify digital tools and features.

Sincerely,

The Jane Addams Grade 6 Science Team & Seattle Public Schools Science Department



## Weather Patterns Unit, Chapter 2

### Lesson 6 (Chapter 2.1) – Air Parcels in the Troposphere

At this point, we should know that energy transferred from a warm air parcel to the colder surrounding air can cause rain. Today, we will be investigating different temperature air parcels to help determine what happens to them when they interact with the surrounding air.

#### Vocabulary:

**AIR PARCEL:** An amount of air that moves as a unit

**CLOUD:** Liquid water droplets suspended in the air

**CONDENSATION:** The process by which a gas changes into a liquid

**ENERGY:** The ability to make things move or change

**EVAPORATION:** to move from one object to another or one place to another

**TEMPERATURE:** A measure of how hot or cold something is; a measure of the average kinetic energy of the molecules of a thing

**TRANSFER:** To move from one object to another or one place to another

**WATER VAPOR:** Water as a gas

**WEATHER:** Conditions such a rain, clouds, wind at a particular time and place

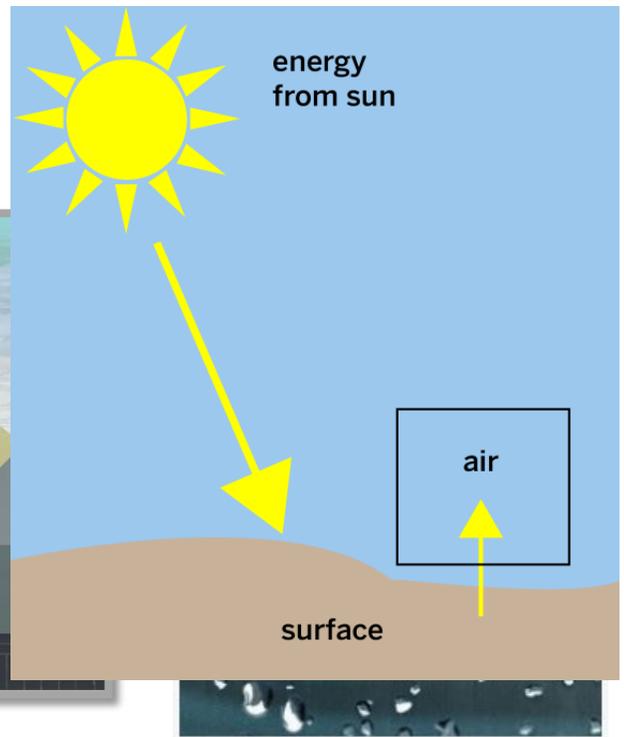
#### Unit Question:

**Why do some rainstorms have more rain than others?**



**Warm Up:**

For today's work, we will need to think back



to some ideas from the Oceans, Atmosphere and Climate unit.

To the right you can see and image the sun, surface and air as well as arrows showing energy transfer.

**Which Statement best describes how the sun heats the air?**

- A) Energy from the sun is transferred to Earth's surface and some of this energy is then transferred to the air
- B) Energy from the sun is transferred directly to the air

**Why did you pick this answer?**

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Weather Event	Local Surface Water	Amount of Rain
Storm 1 (before lake)	low	mild, 6 cm (2.4 in)
Storm 2 (after lake)	high	moderate, 12.7 cm (5 in)
Storm 3 (after lake)	high	severe, 20.3 cm (8 in)
Storm 4 (after lake, July of this year)	high	very severe, 30.5 cm (12 in)

The lake was present during these years.

But, the amount of rain was different from storm to storm. Why?

**Why do you think the amount of rain in Galetown is different from storm to storm?**

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**Today’s Question:** What determines how much an air parcel will cool?

**Simulation Tests:** What happens with different temperature air parcels?

**PART 1:**

1. Launch the Weather Patterns Sim and go to “Reginal Weather 1 mode” by clicking on the “hamburger” in the top left corner
2. Make parcels of different temperatures and observe how high each one rises. Fill out the table below for each test you complete.
3. Answer the question below

	Temperature of the surrounding air at 0 km	Starting air parcel temperature	Final height of the air parcel
<b>Test 1:</b> Hot air parcel			
<b>Test 2:</b> Warm air parcel			
<b>Test 3:</b> Cold air parcel (sunlight at 0)			

Look back at the table for the “Starting air parcel temperature” and the “Final height of the air parcel”. What pattern do you notice?

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What happens to an air parcel after it is heated up?

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Which air parcel rose the highest?

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**PART 2: At this point, we have seen that an air parcel will rise as long as it is warmer than the surrounding air.** Now we will observe what happens to the air around the air parcel as it rises.

1. Launch the Weather Patterns sim and go to “Regional Weather 1” mode
2. Create an air parcel and press “RUN”
3. Observe the temperature of the surrounding air (troposphere) on the right side of the screen.
4. Answer the question below

What do you notice about the temperature of the surrounding air at different heights above the Earth’s surface?

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 **Key Concept**

The troposphere is the \_\_\_\_\_ at the surface and \_\_\_\_\_ at its highest point.

## Vocabulary:

Troposphere: the layer of the atmosphere closest to Earth, where weather happens



## **Air Parcel Demonstration:**

**\*\*For this demonstration, you should watch the video provided for this lesson to see what is supposed to happen. If you are not able to watch the video, contact your teacher so they can support you through this part. You can also find the video just for this part here <https://www.youtube.com/watch?v=n-ZlzqI4sfg>**

In this experiment a plastic bag is placed above a source of heat (a toaster).

1. Predict what will happen when the plastic bag is let go.

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2. What happened to the plastic bag? Why did this happen?

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## Key Concept

If an air parcel is warmer than the surrounding air, it will \_\_\_\_\_.

### Did I get it?

Hot air balloons are like air parcels because they are a section of air in a space that we can observe over time.

If two hot air balloons are filled at the same time, but one is filled with hot air and one is filled with warm air, **which balloon do you think will rise higher and why?**

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### Lesson 6 (2.1) Wrap-Up

- Something other than just the lake is causing Galetown to be getting more rainfall
- Troposphere: the layer of the atmosphere closest to Earth, where weather happens
- The higher in the troposphere you go, the colder it gets
- The warmer an air parcel is, the higher it will travel up in the troposphere

**Key Concept:** The troposphere is warmest at the surface and coldest at its highest point

**Key Concept:** If an air parcel is warmer than the surrounding air, then it will rise.



### **Up Next: Lesson 7 (2.2)**

- Thinking more about the Troposphere
- Reading about a disaster in California and what caused it