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SCHOOLS

# Science Learning Packet

## Grade 6:

# Weather Patterns, Lesson 4

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 4**

AmplifyScience



# Weather Patterns

*\*Amplify Chapter 1, 1.5*

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



## Lesson 4 (Amplify 1.5) Investigating Why Clouds Produce Rain

In our last lesson we read and discussed the article “What Are Clouds?”

What do you remember about how clouds form?

(If you don't remember very much, look back at the article and your annotations.)

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### Vocabulary So Far:

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

**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

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### **Cloud: Liquid water droplets suspended in the air**

Students will collect data from the SIM and the article about clouds to explain cloud formation.

What makes an air parcel cool?

How does the energy change relate to the amount of rain that will fall from the cloud?



What did we learn about air parcels cooling? Remember the plastic bag activity? Which bag had more condensation, the one in the refrigerator or the one left out on the counter? Do you know why?

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Let's look specifically at the section "Cloud formation and Energy" from the article. What evidence can you find to help answer the question what causes an air parcel to cool?

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### **Exploring the SIM**

If you have access to Amplify, you can go into the Weather Patterns SIM and explore now. If you are watching the videos, you can choose to just watch her run the SIM.

Meteorologists use models to help them explain and predict weather. The Weather Patterns Simulation is a scientific model that will make it possible for you to change some factors that you are not able to change in real life. As you observe and analyze what happens as a result of the changes you made, you will better understand rainstorms.

### **Functions in the SIM**

- You can move between Build, Run, and Analyze
- Sunlight and surface water sliders on the Build screen.
- Water vapor and temperature readout in the air parcel in Run.
- Yellow arrows that indicate energy
- Pause, Play, and Reset options in Run.
- Time slider in Analyze.

**Model creating a cloud with some rain in the [Weather Patterns Sim](#).**

We want to set conditions up to create a cloud that will produce a rainfall level between 1 & 2. Rainfall level is a feature in Analyze.

- In Build, set surrounding air temperature to -20°C, the air parcel temperature to 25°C, and the water vapor level to between medium and high.
- Go to Run and observe what happens.
- Go to Analyze. The rainfall level must be between 1 and 2.

Record the following information in the data tables:

Weather Event	Surrounding Air Temp	Starting Air Parcel Temp	Final Air Parcel Temp	Air Parcel Temp Difference	Energy Transferred Out
Cloud- rain (level 1-2)					
Cloud-no rain (level 0)					
Cloud- rain (level 3-4)					

**Bonus SIM Activity-**

1. In Build, set the surrounding air temperature to -25°C and set the air parcel temperature to 35°C. Set the water vapor level as indicated in the data table on the right.
2. Press Run.
3. Press Analyze and record the rainfall level.
4. Repeat steps 1–3 for the second and third tests

Weather event	Air parcel water vapor	Rainfall level
Test 1	low	<input type="text"/>
Test 2	medium	<input type="text"/>
Test 3	high	<input type="text"/>

How did the amount of surface water affect the amount of water vapor in the air?

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## Lesson 5 (1.5) Wrap-Up

- Air parcels cool as a result of energy transfer
- Temperature affects how much rainfall can happen
- The amount of surface water available affects the amount of water vapor

Key Concept-Energy transfers from warm air to cold air until the temperatures become equal.

Key Concept-The more an air parcel loses energy and cools, the more rainfall can happen.



### Up Next: Lesson 6 (1.)6

- Evaluating Claims
- Analyzing Data
- Reflecting on Key Concepts in Chapter 1