

LESSON 10

What causes fronts to move?

Adaptations for:

STEP 1: Remember air pressure? There's more to it. (pg. 39)

STEP 2: Analyze pressure data over a region (pg. 40)

EXPLANATION:

Students who are blind or have low vision may require enlarged visuals, tactile representations, or guided verbal descriptions when interpreting the circumference of the bean-filled balloon. Students with autism or sensory sensitivities may be affected by sensory triggers. Others might require additional processing time, simplified instructions, or opportunities to engage through touch rather than relying solely on visual cues.

ADAPTATIONS FOR STEPS 1-2:

UDL Principle: [Multiple Means of Representation](#); [Multiple Means of Action & Expression](#)

- Tactile models of the high- and low-pressure diagrams and the air pressure map are necessary for students who are blind or have low vision to participate. For example, use tactile raised arrows so students can feel the direction that air is moving on the high- and low-pressure diagrams.
- On the air pressure map, use different textured dots for the highest pressures (above 1015 mB) and the lowest pressures (below 995 mB), as well as a raised line along the storm front.
- For students with limited vision, providing high-contrast visuals, enlarged images, and opportunities to feel the activity materials (e.g., the bean-filled balloon) before beginning the activity can enhance accessibility.
- Breaking instructions into short, explicit, single-step directions, along with visual cues or task cards, reduces cognitive load and supports students who require repeated clarification or have processing challenges.
- Allow flexible options for recording observations, such as drawing, labeling, dictating responses, or using sentence frames. This allows students with fine-motor, visual, or executive-function challenges to demonstrate understanding in accessible ways.
- Create visual scaffolds, such as doodle notes (linked below), to help students with visual processing differences better understand concepts such as air mass and density. The doodle notes help to simplify key concepts and decrease cognitive load.

ADAPTED MATERIALS:

[Lesson 10: Doodle Notes](#)

- [Editable Lesson 10 Doodle Notes](#) (Canva file)

WHAT CAUSES FRONTS TO MOVE?

T ALERT TONIGHT
 26 27 27 27
 26 27 30 32
 WARNING, COLD WEATHER ADVISORY TONIGHT

Write your observations
 Red balloons weigh more than blue. The straw like board. The larger red balloon (it's heavier) more air mass same weight.
 Jar is filled over top with almonds hard with 10 almonds was lighter than hard with 60 almonds more pressure.

Draw the arrows to show air mass movement
 atmosphere atmosphere
 Surface → atmosphere → surface

KEY:
 L the center of an low pressure
 H the center of an high pressure
 Different pressures
 cold front
 warm front
 occluded front
 1014.4 1014.0
 1015.8
 barometric pressure (mB)
 Highest pressures: more than 1015 mB
 Lowest pressures: less than 995 mB

Labels on map: cold front, warm front, occluded front, High, Low, lowest pressure, highest pressure.

Map locations: SALT LAKE CITY, DENVER, OMAHA, CHICAGO, LAS VEGAS, WICHITA, ST. LOUIS, PHOENIX, AMARILLO, MEMPHIS, EL PASO, DFW, ATLANTA.

Example of doodle notes completed by a focal student. Having all the main points organized on one page makes it easier to connect visuals to vocabulary and ideas.

IMPLEMENTATION NOTES:

The adaptations not only support the focal student but also create a universally accessible learning environment where all students can successfully explore the concepts of air mass, density, and gas behavior.

MY STUDENTS' UNIQUE NEEDS:

My focal student relies more on peripheral vision than direct sight. Because of this, activities that require close visual inspection (such as noticing small changes in the balloon size) take extra time, require verbal clarification, and necessitate scaffolding personalized doodle notes for support. This student often asks "What?" with each step of instructions, so multi-step directions need to be broken into single, clear prompts to keep things understandable and prevent frustration.

