

WEATHER UNIT STUDY WORKBOOK

Five ready-to-use activities generated through HomeTrail's Nest pack system for a fourth-grade learner. Print the pages you need and use the separate audio episode alongside the workbook.

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Deep Dive

Weather Detectives: From Observations to Forecasts

Meteorologists are weather detectives. They study the atmosphere, the layer of air around Earth, to understand what is happening now and what may happen next. Their work begins with careful observations, continues with pattern-finding, and ends with forecasts that help people plan and stay safe.

First, They Observe

Weather means the condition of the atmosphere at a certain time and place. Meteorologists observe temperature, wind strength, clouds, and the amount and form of moisture in the air, such as rain or snow. These observations are important because a forecast needs information about what the atmosphere is doing right now.

Next, They Look for Patterns

Weather in one place is connected to larger patterns. Solar energy, Earth's oceans, different kinds of land, and Earth's motion all interact with the atmosphere. These interactions help create the local weather we experience. Meteorologists study large-scale weather patterns, air movement, clouds, and storms to understand how conditions may change.

Then, They Make a Forecast

A weather forecast is an estimate of the conditions expected in the near future. Forecasts are based on observations and statistical models that compare today's conditions with similar conditions from past weather events. Meteorologists use many kinds of weather information. NOAA's weather school includes lessons about satellites, Doppler radar, upper-air conditions, clouds, and global weather.

Finally, They Explain What We Know

A forecast is not a promise. It is an estimate based on evidence and patterns. Some weather is harder to predict than other weather. Tornadoes, for example, are notoriously difficult to predict, even though scientists have improved their understanding and warning times. People should use reliable weather information, pay attention to threatening conditions, and respond to safety instructions.

Remember these

- Weather describes the atmosphere at a particular time and place.
- Meteorologists observe temperature, moisture, clouds, and wind.
- Weather patterns are shaped by interactions among sunlight, oceans, land, Earth's motion, and the atmosphere.

- A forecast is an estimate based on current observations and similar past weather conditions.
- Forecasts include uncertainty because some weather events are difficult to predict.

Try this

Keep a weather journal for five days. Each day, record the temperature if you have a thermometer, describe the clouds, note whether the air is dry or wet, and describe the wind as calm or strong. Before checking a forecast, write your own prediction for the next day. Then compare your prediction with the forecast and with the actual weather. Which observations helped you most?

Think about it

Why do you think it is useful to know both a weather forecast and how certain or uncertain that forecast may be?

Sources

- [Weather and atmosphere | National Oceanic and Atmospheric Administration](https://www.noaa.gov/our-work/programs/weather-and-atmosphere-program/)www.noaa.gov
- [JetStream | National Oceanic and Atmospheric Administration](https://www.noaa.gov/our-work/programs/jetstream/)www.noaa.gov



Weather Watchers: How Meteorologists Make Forecasts

Instructions: Read each question carefully and select the best answer. When you're ready, tap Submit to see your results.

0 of 10 answered

1. Which tool measures the temperature of the air?

- ☐ A. Rain gauge
- ☐ B. Thermometer
- ☐ C. Anemometer
- ☐ D. Weather radar

2. What does a rain gauge measure?

- ☐ A. The amount of rain that has fallen
- ☐ B. The amount of sunlight in a day
- ☐ C. The direction the wind is blowing
- ☐ D. The temperature of clouds

3. Why do meteorologists use weather satellites?

- ☐ A. To make clouds move faster
- ☐ B. To stop storms from forming
- ☐ C. To take pictures and collect information about weather from space
- ☐ D. To measure the temperature inside people's homes

4. A meteorologist sees dark clouds growing taller, warmer air rising, and strong winds nearby. What weather might these clues suggest?

- ☐ A. A clear, calm day
- ☐ B. A week of freezing temperatures

☐ C. A very dry morning with no clouds

☐ D. A possible thunderstorm

5. Why do meteorologists compare today's weather with weather from past days?

☐ A. To find out what color the sky was

☐ B. To notice patterns that may help predict what happens next

☐ C. To make yesterday's weather change

☐ D. To avoid using weather instruments

6. A forecast says there is a 70% chance of rain. What does this mean?

☐ A. It will rain for exactly 70 minutes

☐ B. Rain is likely, but it is not guaranteed

☐ C. Rain will cover exactly 70% of every street

☐ D. It will definitely rain all day

7. Which action best shows how meteorologists communicate uncertainty?

☐ A. Saying the weather will always happen exactly as predicted

☐ B. Leaving out all information about the forecast

☐ C. Using only yesterday's temperature

☐ D. Saying a storm is possible and giving a chance of rain

8. Meteorologists use information from many places, such as weather stations, satellites, and radar, when making a forecast.

☐ True

☐ False

9. If the morning forecast is sunny, meteorologists never need to update it later in the day.

☐ True

☐ False

10. A weather forecast is a careful prediction, not a guarantee that every detail will happen exactly as stated.

☐ True

☐ False

Word Search: weather observations, temperature, clouds, wind, precipitation, forecast, atmosphere, humidity, and air pressure

Explore the language of weather observations by finding words about clouds, wind, precipitation, temperature, and air pressure. These terms will help you become a careful weather watcher!

12 words left to find.

J	B	F	A	G	X	P	J	F	C	S	D
H	F	Q	A	H	U	M	I	D	I	T	Y
F	O	L	A	I	Y	V	N	P	X	A	O
G	R	C	L	O	U	D	S	S	P	R	T
D	E	P	B	V	J	E	N	E	Z	O	C
R	C	B	R	C	H	O	H	F	C	L	Q
I	A	H	E	E	W	M	J	M	I	N	M
Z	S	R	E	U	S	E	S	M	W	V	H
Z	T	A	Z	Z	F	S	A	U	I	X	Q
L	X	D	E	U	N	T	U	O	N	E	Q
E	R	A	D	Q	E	M	Z	R	D	N	T
Y	I	R	C	T	R	A	I	N	E	O	Y

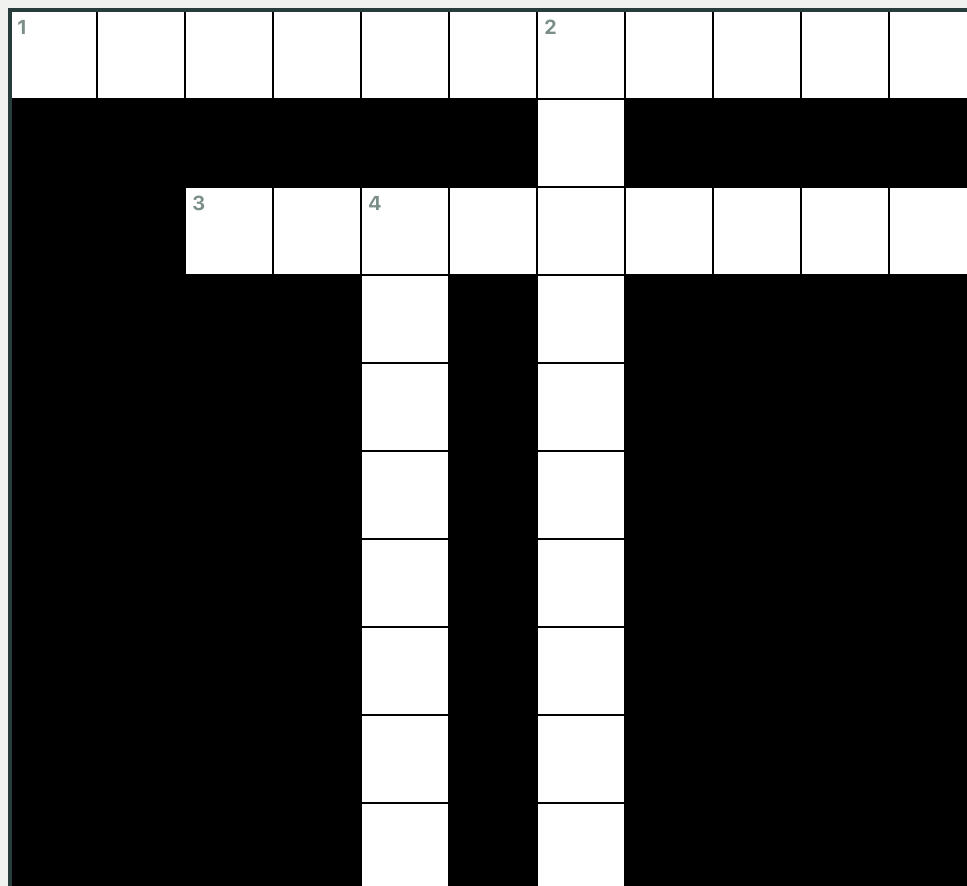
Find these words:

- FORECAST
- HUMIDITY
- PRESSURE
- DRIZZLE
- CLIMATE
- CLOUDS
- BREEZE
- SUNNY
- RADAR
- WIND
- RAIN
- SNOW

Weather Watchers Crossword

Instructions: Tap a clue, then fill each box with one letter. Tap again to switch between Across and Down.

4 clues left.



ACROSS

1. A measure of how hot or cold the air is.
3. An instrument used to measure air pressure.

DOWN

2. The layer of gases, including air, that surrounds Earth.
4. The amount of rain that falls in a certain place and time.

