

WEATHER AND RACING



**GRADE LEVEL: ELEMENTARY SCHOOL
 2ND - 5TH GRADE**

Student Objectives

- Identify different weather conditions by visual inspection and reading forecast models
- Understand how different weather conditions can impact racing
- Demonstrate how precipitation can impact racing
- Identify different weather tools used to measure weather conditions
- Track weather conditions through simulated radar

Materials List

- Map of the United States (PDF or online options)
 - o <https://www.visitusa.org.uk/default.aspx?pname=Explore-USA&upid=2&ca=CS>
 - o <https://geology.com/world/the-united-states-of-america-satellite-image.shtml>
- Weather forecast worksheet (PDF)
- Weather comparison chart (worksheet)
- Photo of NASCAR tires and rain at the track
- Markers, colored pencils or crayons
- Ruler
- Spray bottle (or an empty bottle by drilling small holes in the cap to create a sprinkler effect)
- Aluminum foil, parchment paper or plastic bag
- Cookie sheet or aluminum pan (rectangle)
- Toy car with wheels (small)





Lesson Plan and Procedures for Adults

Note: Weather and life sciences are introduced to students starting in pre-school and taught throughout their student careers. This lesson is designed to have students think about weather from a job as well as personal impact.

1. Review the Kindergarten [\[LINK\]](#) – 2nd grade lesson plan, numbers 1 through 4 to refresh on what weather, seasons and conditions are.
2. Provide the student(s) with either a digital or print map of the U.S. Ask the student(s) to find and plot at least ten different race locations – both city and state – from the NASCAR schedule on the map.
 - o NASCAR schedule: <https://www.nascar.com/nascar-cup-series/2020/schedule/>
3. Have the student(s) pick three of the locations to explore more about their weather from last two years, looking at the same timeframe the race will be held in 2020. (HINT: Search the city and state weather from a previous year for a particular day and time on a site like Google.)
4. Compare weather conditions. Write down the temperature, wind conditions (speed), weather conditions (sunny, windy, raining, etc.) and change of precipitation over Friday, Saturday and Sunday.
5. Ask the student(s) to make a comparison between the years. Are there any statistics that are close or the same? Examples include temperature range, precipitation level or anticipated wind conditions.
6. Have the student(s) consider why weather might be an essential factor in racing. How might weather impact a race? Write down some of the ideas.
7. Let's explore the weather and its role in racing. Discuss with the student(s) how weather is an essential factor when looking at where we race, when we race and if we can race that day. Talk about how weather impacts our lives daily and what decisions we make due to weather, such as playing outside, what to wear and traveling.
8. Using the information on weather and racing, discuss some of the impacts geography and weather have on racing.





9. Conduct the experiment from the Kindergarten – 2nd Grade lesson plan (#9). Complete the experiment twice, so you can compare the two. After trying it with wet and dry conditions, change a factor or variable.
 - Try a slight incline of the pan or track surface. Elevate the track slightly by placing a book under the pan. What impact does it have on a dry or wet surface?
 - Let's see how heat impacts it! Place the pan in the sun and monitor the heat level and evaporation of the water on the track. Use two pans – one with water (no more than 1/8 or 1/4 cup) on the pan and the other with no water. Measure the temperature reading of the track surface without water every hour for at least 4 hours between 10 a.m. and 4 p.m. What is happening to the surface? Measure the amount of water in the pan at least four times. Is water evaporating?
10. Using the forecast PDF, explain that NASCAR and teams use the weather forecast to determine how long (or even if) they can race during a weekend. Teams arrive early at the tracks (at least two days before race day) to practice, qualify - or determine where they start in the race - and allow their car to adjust to the race track weather conditions (hot, humid, dry.) Ask the student(s) to answer the questions on the PDF. Can they race?
11. Using the data from activity steps 3 and 4, have the student(s) create their own forecast for an upcoming race. What would they predict knowing the weather patterns from years past?
12. Conclude the lesson by reviewing the role weather plays in racing.

Background information about weather and racing:

- NASCAR races in different climates and geographical conditions - from deserts to beaches, mountains to lakes and north to south.
- Weather in any geographical location can change due to season, and weather patterns can determine if a race will finish (or even begin.)
- Race car tires do not have tread like our cars. Some race car tires have thin tread like dirt track tires, but the national series (Cup, Xfinity and Truck) do not. Without tread, cars cannot race in the rain – even if it's just a little misty.
- Tracking weather systems is vital to strategizing in racing. If you start the race and it begins to rain, it can take up to two or three hours to dry a track with large mounted jet engines (called Air Titans) before a race can resume. If the rain is expected for an extended period of time, a race may get postponed. Or, if it's raining at the beginning of the race, it can be delayed to start. Rain is a big deal.
- Hot, sunny days are also impactful. The hotter the sun and outside temperature, the hotter the track will be. And the more cars racing on a track, the more heat it will get from the tires. Racetracks can start at 80 degrees and rise to more than 130 degrees by the end of a race. Tires will be impacted as the surface becomes slick due to the rubber as well the asphalt giving off oil.





- Sun direction can also impact how well a driver can see. A setting sun in the west can make it hard for a driver to race, as the sun is in their eyes. If we go from a day race to night, the conditions changing will also change how a driver races.
- Weather conditions and predictions are assessed by NASCAR to determine race impacts on the day. Crew chiefs utilize weather to determine how to set up the handling of the car, such as light air pressure in the tires or the engine's intake of air.
- NASCAR has rules based on weather. If a race has started and drivers have completed 50 percent of the laps or traveled half of the way, then whoever was in the lead when it started to rain/other inclement weather wins. If the race has not traveled at least half of the way, then the race will be on a weather delay or postponed to the following day, and a winner will be determined when it's restarted.
- NASCAR crew chiefs will watch the weather radar before and during the race to see if rain or inclement weather is anticipated. They will adjust their plans based on what the weather is doing, how many laps have been completed and how many more they can complete before the race might stop.

