

The Arizona Monsoon Reading

The term “monsoon” refers to the wind shift that brings us thunderstorms during the summer months of late June, July, August and early September. During the winter, the wind flow is from the west (California) or the northwest (Nevada). When summer comes, the winds come from a southern (Mexico and Gulf of California) or southeastern direction (Gulf of Mexico). This change in wind direction allows summertime moisture to move from the Pacific Ocean and the Gulf of California into Arizona and provides fuel for thunderstorms.

Wind Direction in the Summer



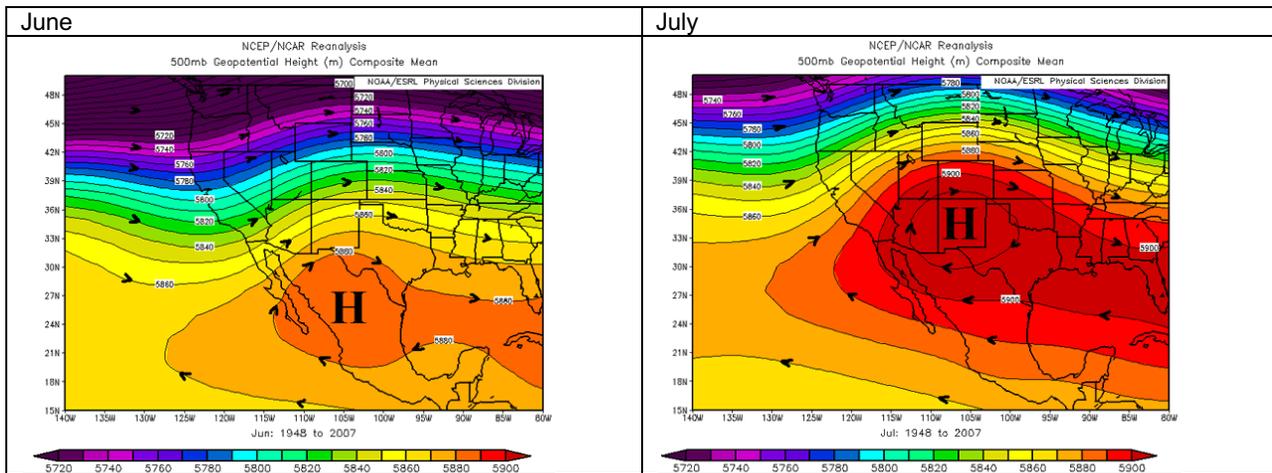
http://www.wrh.noaa.gov/twc/monsoon/monsoon_NA.php

Meteorologists (people who study the weather) say the causes of the monsoon are:

- The movement of huge upper air high-pressure cells to the north as winter changes to summer
- The heating (100° to 108°F in Phoenix) of the desert that creates rising air and surface low-pressure.

The two charts below show the difference between the high-pressure cells in June and July. Look where the high (H) is in relation to Arizona.

High Pressure Cell in June and July



http://www.wrh.noaa.gov/twc/monsoon/monsoon_NA.php

Because the high-pressure cell moves northward and the temperatures rise, thunderstorms often develop during the summer. The Arizona storms usually are quick and last about 30-40 minutes. These storms develop in stages. In the first stage, warm air rises and forms cumulus-type clouds. Next strong currents of air move up and down. When the air hits the ground, a dust storm (called a haboob) is created. This dust storm creates a wall of sand that can travel at over 30 miles per hour and rise 3000 feet high. In the last stage, rain falls. Half of Arizona's rainfall for the year can happen during the summer.

Monsoon Storm

A summer monsoon storm can be dangerous. It is important to know what to do during these storms to stay safe. Here are suggestions from the National Weather Service.



<https://earthsky.org/earth/what-are-haboobs>

Lightning

- If you hear thunder, you are close enough to a storm to be struck by lightning. Go to a safe place immediately! The safest locations are sturdy buildings and hard-topped vehicles. Wait there until 30 minutes AFTER the last rumble of thunder is heard.
- Get away from open areas, including porches, trees, patios, and swimming pools.
- Summer storms are often in the afternoon and early evening. Plan outdoor activities to happen before or after these times, especially if you live in higher elevations where lightning is more common.
- Do not touch any plumbing or electric wires during a storm.
- Remember, it does not have to be raining for you to be struck by lightning. Lightning can strikes up to 60 miles away from the nearest rainfall!
- Bring pets indoors. Lightning and thunder can be very scary for pets. They might panic or run away.
- If someone is struck by lightning, call 911 immediately.

Lightning During a Thunderstorm



http://www.wrh.noaa.gov/twc/monsoon/monsoon_safety.php

Strong Winds

- Arizona thunderstorms have strong winds, sometimes more than 40 miles per hour. The strongest wind gusts can be 100 miles per hour and can produce damage similar to a tornado! Anytime a thunderstorm gets near, move indoors to avoid flying debris.
- The National Weather Service can issue a Severe Thunderstorm Warning. That means the storm can have wind gusts of more than 60 miles per hour. Go to a room in the middle of your house. Stay away from windows.
- Mobile homes can be heavily damaged in the winds. Move to a safer structure.
- Stay inside! Most people are killed or hurt in severe thunderstorms by trees falling on them, from flying debris, or from downed power lines.
- Never touch a downed power line. Call for help instead.
- Before the monsoon season, it is a good idea to tie down loose outdoor furniture and garbage cans or move them indoors. These often get blown around in our summer thunderstorms.

Downed Power Lines



<https://cronkitenews.azpbs.org/2018/07/09/monsoon-storm-buckeye/>

Dust Storms

- Winds in any thunderstorm can lift huge clouds of dust. Because it is hard to see, car accidents on roadways can happen.
- Dust storms usually happen in the early part of the monsoon.
- If you run into a dust storm while riding in a car here is what the driver should do. Pull off the road at once. Turn off the headlights and taillights and put the vehicle in "PARK." Take his/her foot off the brake because other motorists may follow taillights while trying to get through the dust storm. Seeing the taillights might cause them to rear-end the parked car.
- Stay where you are until the dust storm passes. Dust storms usually last only a few minutes.

Flash Floods

- Flash floods are common in Arizona. There are thousands of low water crossing and dips that flood every summer. Know where they are and stay away from them during heavy rains.
- Never ever drive into a flooded roadway. It is hard to tell how deep the water is. Also, the road itself may be damaged or gone. It only takes about 1 to 2 feet of water to float most vehicles, including SUVs.
- Never drive around barricades. They are there for a reason.
- Do not play near washes or storm drains after any rainfall, no matter how light. These flood easily and quickly, and storm drains are usually so large that children can be swept away.
- Be careful of thunderstorms that seem to be far away, especially if they're over mountains. Flash flooding can occur many miles away from the thunderstorm. The water from the storms then flows down into valleys and can be very dangerous.
- Do not camp overnight near streams during the monsoon. Although many of our thunderstorms happen during the afternoon and evening, some of our worst flash floods can take place in the middle of the night.
- Hikers and mountain bikers should try to get out earlier in the day to stay away from the dangers of not only flash flooding, but also lightning. Wherever you are hiking during the monsoon, be aware of your escape routes, follow ranger instructions, and be ready to move to higher ground quickly.

A Car Stranded in a Flooded Street after a Storm



http://www.wrh.noaa.gov/twc/monsoon/monsoon_safety.php

Name _____

Hip, Hip, Hooray, It's a Monsoon Day!

Answer the following questions in complete sentences.

1. What date is San Juan's Day?

2. Using the charts in the Arizona Monsoon Reading is a monsoon storm more likely to happen during June or July? Why?

3. According to the book, what is the temperature on San Juan's Day before the storm?

What is the temperature during and after the storm?

4. In the story, the children go out and play in the wind. Why is this not a good idea?

5. Why did Tata tell the children not to play in the arroyos during the Monsoon season?

6. How did Papa protect the children from lightning?

7. How did Mama protect the house from lightning?

8. Why did Papa tell the children to not hide under a tree during a lightning storm?

9. What is one animal in the book that is affected by the storm?

10. What does this animal do either before or after the storm?

11. Think about the languages used in the book. What Arizona culture is the story based on?

12. Write three words that you learned in the story and what they mean.

Word	Meaning

13. Draw a picture of the damage that water can do during a flash flood.

14. Draw a picture of the damage that wind can do during a monsoon storm.

Hip, Hip, Hooray, It's a Monsoon Day!

Answer Key

1. What date is San Juan's Day? **San Juan's Day is June 24th.**
2. Using the charts in the Arizona Monsoon Reading is a monsoon storm more likely to happen during June or July? Why? **A monsoon storm would more likely happen in July. The high pressure cell is right over Arizona.**
3. According to the book, what is the temperature on San Juan's Day before the storm? **It is hot before the storm.**
What is the temperature during and after the storm? **It is cooler after the storm.**
4. In the story, the children go out and play in the wind. Why is this not a good idea? **You could be hit by flying objects when the wind is blowing.**
5. Why did Tata tell the children not to play in the arroyos during the Monsoon season? **The arroyos fill with water and you could fall in.**
6. How did Papa protect the children from lightning?
He said to go into the house or into the car with the windows closed.
7. How did Mama protect the house from lightning?
Mama covered the mirrors with sheets to keep the lightning from hitting inside the house.
8. Why did Papa tell the children to not hide under a tree during a lightning storm? **Papa said that lightning looks for trees to hit. Lightning often strikes trees.**
9. What is one animal in the book that is affected by the storm? **Quail, ants, lizards, and spadefoot toad are mentioned in the book.**
10. What does this animal do either before of after the storm?
The quail run to find shelter. Ants line up and march underground. Lizards hide on the ground and are protected by rocks. Spadefoot toads come out from underground.
11. Think about the languages used in the book. What Arizona culture is the story based on? **Possible answers: The book is written in Spanish as well as English. Some of the words are in Spanish. This would refer to the Hispanic people who live in Arizona. The book describes people who have roots in Spain or Mexico.**
12. Write three words that you learned in the story and what they mean. **Answers will vary.**
13. Draw a picture of the damage that water can do during a flash flood.
Drawings will vary.
14. Draw a picture of the damage that wind can do during a monsoon storm.
Drawings will vary.

Scoring Guide for Monsoon Booklet

The title page will have the title and student's name in the center of the page. (3 pts) _____

**Arizona Monsoon
by
Your Name**

Do not write on the first inside page.

Page 1 should have the class definition for monsoon. (2 pts) _____

Page 2 should have the title: **How to Stay Safe When Lightning is Near** at the top of the page with a good illustration below it.

(5 pts) _____

Page 3 should have the title: **How to Stay Safe When Strong Winds blow** at the top of the page with a good illustration below it.

(5 pts) _____

Page 4 should have the title: **How to Stay Safe When Dust Storms Happen** at the top of the page with a good illustration below it.

(5 pts) _____

Page 5 should have the title: **How to Stay Safe When Flash Floods Happen** at the top of the page with a good illustration below it.

(5 pts) _____

Titles are neatly done and spelled correctly. (5 pts) _____

Illustrations clearly show what to do and are colorful. (5 pts) _____

Total points _____ (35 pts)