Tornadoes: Nature's Fierce Funnels

Tornadoes are violently rotating columns of air that stretch from thunderstorms down to the ground. Often called "twisters," these powerful natural disasters can reach wind speeds of over 250 miles per hour and carve paths of destruction up to 50 miles long and over a mile wide. They are commonly formed during severe thunderstorms, often accompanied by large hail and a roar like a freight train. Supercell thunderstorms, which are large and persistent storm systems with rotating winds, are responsible for producing the most dangerous tornadoes. Although tornadoes occur worldwide, the United States—especially in regions like Texas, Oklahoma, and Kansas, known as "Tornado Alley"—experiences the highest frequency and intensity.

Tornadoes form when warm, moist air near the ground meets cold, dry air from above, creating instability. This contrast leads to thunderstorms, and under the right wind conditions, a rotating updraft called a mesocyclone can develop. As the storm intensifies, the rotation strengthens and a funnel cloud forms, becoming a tornado when it touches the ground. Tornadoes can happen at any time of year, but they are most common in spring and early summer, particularly in the late afternoon when the surface is warmest. Related phenomena include waterspouts, which form over warm water and may become tornadoes if they move ashore, and dust devils, which are dry whirlwinds not linked to thunderstorms.

Once a tornado touches down, it may last only seconds or persist for several hours. Most tornadoes are about 660 feet wide, move at around 30 miles per hour, and travel no more than six miles. However, some can reach 300 miles per hour and cause catastrophic damage. Tornadoes are classified on the Enhanced Fujita (EF) scale based on the damage they cause. In the U.S., tornadoes kill about 70 people annually and cause an estimated $400 million in damage. Buildings can be torn apart, vehicles lifted into the air, and people injured or killed by flying debris such as metal, wood, or glass.

Modern forecasting tools like Doppler radar, weather satellites, and computer models have significantly improved tornado prediction. Doppler radar can detect wind rotation within storms, allowing meteorologists to issue tornado watches and warnings. A watch signals favorable conditions for tornadoes, while a warning means one has been seen or detected on radar. Scientists and storm chasers also collect data by placing instruments in tornadoes' paths, though this can be extremely dangerous. The death of National Geographic Explorer Tim Samaras and his team in 2013 during such research serves as a reminder of the power and unpredictability of these storms.

Source: https://www.nationalgeographic.com/

A. **Vocabulary Essay Questions**
   1. What is a synonym for the word "violently" as used in the phrase "violently rotating columns of air"?
      Answer: _____

   2. What is a synonym for "persistent" in the sentence "Supercell thunderstorms, which are large and persistent storm systems…"?
      Answer: _____

   3. What is a synonym for "intensifies" in the sentence "…it can intensify. Moisture in the mesocyclone condenses…"?
      Answer: _____

   4. What word has a similar meaning to "catastrophic" in the phrase "…some can reach 300 miles per hour and cause catastrophic damage"?
      Answer: _____

5. What is another word for "detect" in the sentence "Doppler radar can detect wind rotation within storms…"?
    Answer: _____

B. **Multiple Choice Questions**
    1. What is the main idea of the article "Tornadoes: Nature's Fierce Funnels"?
        A. Tornadoes only happen in Tornado Alley
        B. Tornadoes are minor weather events with little damage
        C. Tornadoes are powerful natural disasters, and understanding their formation, impact, and detection helps reduce their dangers
        D. Tornadoes can be stopped by using technology

    2. What is the primary purpose of the text?
        A. To entertain readers with tornado stories
        B. To persuade readers to become storm chasers
        C. To inform readers about tornadoes, how they form, and their impact
        D. To describe weather patterns in the U.S.

    3. According to the text, what area in the United States experiences the most tornadoes?
        A. The East Coast
        B. Tornado Valley
        C. Tornado Alley
        D. The Great Lakes

    4. What tool do meteorologists use to detect rotation within a storm?
        A. Infrared cameras
        B. Weather balloons
        C. Doppler radar
        D. Satellite radio

    5. What is the conclusion or final message of the article?
        A. Tornadoes are no longer dangerous due to advanced technology
        B. The deaths of storm chasers show that tornado research can be risky, but it's important for improving predictions
        C. Tornadoes happen less frequently today
        D. Everyone should become a storm chaser

C. **Essay Questions**
    Explain how a tornado forms based on your own language

    Answer:
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