EXCERPT TO WRITE ABOUT

"Where Do Tornadoes Come From?"

From *How Come? Every Kid's Science Questions Explained*

by Kathy Wollard

Name: _____ Date: _____

▶ **Directions:**

- **Before you start reading this article, look at the title and the question and write down what you think the answer is here:**

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- **Read the article through once to gain a general understanding. Highlight any unfamiliar words.**
- **Read the text again, highlighting important words, phrases, and sentences that answer the question from the title. Jot your thinking in the margins.**

Tornadoes, although small, are the most powerful storms in nature. Twisting and turning, they snake down from clouds and wreak havoc, exploding houses, tossing cars like baseballs, and pulling trees up by their roots. Storm survivors may find even pieces of straw driven into the side of trees like nails. The sound of an approaching tornado has been described as the roar of a monster freight train.

The United States is the tornado capital of the world, with an average of 700 twisters a year. The country that comes in second on the tornado hit list is Australia, with a measly 15. (Some U.S. states get more tornadoes than others. From 1953 to 1980, Alaska had one lonely tornado, while Kansas—home state of Dorothy and Toto—had more than 1,200.)

The recipe for a tornado? Take a big thunderstorm. Add winds blowing from opposite directions, then throw in a strong updraft.

If you were to look at the top of a big thunderstorm, you would see the cloud tops bubbling up and then subsiding as powerful gusts of wind (the updraft) surge up through the clouds. A tornado sometimes forms when the air in the updraft begins to rotate, as opposing winds in the storm spin it around.

The spinning column of rising air is called a mesocyclone. Such a mass of whirling air and cloud, like the whirling water around a bathtub drain, is called a vortex. In the center of the storm vortex, the air pressure drops, as more air is sucked into the spinning part. No one knows just how low the pressure can drop, but some scientists estimate it may fall to half normal air pressure.

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Some mesocyclones get stronger, spinning faster and faster as they shrink. As the pressure in the center drops, the whirling air mass takes on the familiar "funnel" shape we know as a tornado. And as more air gets pulled into the funnel, it accelerates upward, stretching the tube.

A tornado may be shaped like a cone, or a thick pillar, or a long, thin, twisty tube. Tornadoes come in different colors, too. When the funnel cloud first dips down from the sky, it may be dirty white or gray. But as it lifts up dust and debris from the ground, it often turns brown or clay-red.

Wind speeds may reach 600 miles an hour. Pieces of wood and metal picked up from the ground hurtle around in the tornado at the same speeds, becoming lethal weapons. And the extremely low pressure in the center can explode small closed buildings as the funnel passes overhead. Lucky for us, meteorologists are getting better and better at predicting when a tornado will form. If a tornado warning is issued, the northeast corner of a basement or the center of a first floor is the safest place to be. Outside, a ditch or other low-lying area is the best bet.

Note: Kathy Wollard uses many techniques for engaging the reader with her subject matter. Instead of delivering just plain facts about tornadoes, she uses descriptive words, similes, metaphors, and comparisons to help us envision both the science and the havoc of these storms. Choose a paragraph to see what you notice and what you might try in your own nonfiction writing. For example, in paragraph one, notice the verbs: *twisting and turning, snake, exploding, tossing, pulling, driven*—do you feel the "wind energy" of those words? Wollard likens tornadoes to familiar things her reader might know. Why does she do that? For example, the tornado's approach is "the roar of a monster freight train." In paragraph four, she helps us understand *vortex* by reminding us that we see one in action when the water whirls around a bathtub drain. Read this excerpt and think about how Wollard is clearly writing for a particular audience of readers about your age. Might that be why she alluded to Dorothy and Toto in paragraph two? Or the recipe in paragraph three?