

From Toothpicks to Tires

If you were asked the question “How many times a day do you use or see products made from a tree?” would you guess three, ten, or 100 times? Most of us have only a small **inkling** of how much trees **impact** and improve our lives.

One of the most easily identified uses of trees is in the construction industry. Trees are used to make lumber and plywood, which are then used to construct all types of buildings. Look around your bedroom and you’ll also see wood that’s been used to make furniture, doors, window frames, trim, and flooring. Search even closer and you’ll notice pencils made from wood, wooden handles, picture frames, and lots more. If you had X-ray vision, you’d also see insulation behind your walls and roofing above your head; both may be made from wood products.

You already know that wood is used to make the paper in the books you read, the worksheets you complete, and the tests you **labor** over. But you may be surprised to learn that wood is also used to make lots of other products you use in your daily life. **By-products** from trees are in everything from food flavorings to glue to deodorants! Tree by-products such as cinnamon, maple syrup, artificial vanilla flavoring, and imitation bacon add flavor to our world. Trees are also used to make items such as varnish, **adhesives**, cleaning products, and even rubber tires.

Trees also impact our lives in other important ways. They help clean the air we breathe by removing harmful carbon dioxide from the atmosphere. In the areas around your home and school, trees provide shade, which can help lower energy costs. The roots of trees hold the soil and help prevent landslides and **erosion**.

It’s clear that trees aren’t just plants that are pretty to look at. From toothpicks to tires, they are an important **natural resource** that we benefit from every single day.



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Strict environmental standards have helped make forestry, paper, and packaging among the most sustainable industries in existence. These internationally respected forest management standards demonstrate a commitment to sustainability.



On another sheet of paper, draw an outline of a tree, including the trunk and roots. Then choose one of these activities to complete inside the outline:

- Use context and other sources to define each boldfaced word above.
- Write a one-paragraph summary of the article.

“From Toothpicks to Tires”

Answer Key

Summaries will vary.

Definitions will vary.

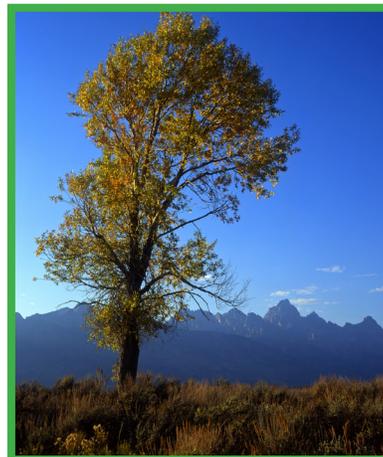
- **inkling**: a slight, uncertain idea about something
- **impact**: a major influence or effect
- **labor**: to work hard
- **by-product**: something that is produced during the production of something else
- **adhesive**: a substance that causes adherence
- **erosion**: the gradual process of wearing something away
- **natural resource**: a substance that occurs naturally in the earth and was not made by humans



Surviving and Thriving Trees

Trees flourish and thrive in extreme temperatures and conditions. Learn a little more about these tree survivalists by solving these math word problems involving integers.

1. Bur oaks that grow in North America live in areas with temperatures that range from -20°F to 20°F . What is the difference between these temperatures?
2. City trees face hotter temperatures than trees in nearby wooded areas because the large amounts of asphalt and concrete absorb and reflect heat. City temperatures are 9°F to 12°F hotter than surrounding wooded areas. If the temperature in a wooded area is -2°F , in what range would the temperature in a nearby city be?
3. The hardy shagbark hickory withstands extreme temperatures that may go from -40°F to a high of 115°F . What is the difference between these two temperatures?
4. The whitebark pine can live in temperatures as low as -9°C , while the Rocky Mountain bristlecone pine can only handle temperatures as low as 1.5°C . What is the difference between these two temperatures?
5. Death Valley National Park, one of the hottest and driest places in North America, is home to trees that have adapted to the heat, such as the honey mesquite, pinyon pine, and juniper. The highest recorded temperature in Death Valley was 57°C , while the coldest was -10°C . What is the difference between these two temperatures?
6. Another tree survivor is the cottonwood. In Kansas, cottonwood trees have lived through a low of -40°F and a high of 121°F . What is the difference between these two temperatures?



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Cottonwood trees can survive extreme temperatures and make good shade trees.

Trees, which are the primary raw material for making paper, are a renewable resource. Forest management standards require, among other things, that several trees be replanted or naturally regenerated for every tree harvested.



Bonus Box:

Not even the hardest tree can survive in Badwater Basin in Death Valley National Park. It is the lowest point in North America at 282 feet below sea level. The highest point in this park is Telescope Peak, which is 11,049 feet above sea level. What is the difference in elevation between these two places?

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“Surviving and Thriving Trees”

Answer Key

1. 40 degrees
2. 7 to 10 degrees
3. 155 degrees
4. 10.5 degrees
5. 67 degrees
6. 161 degrees

Bonus box: 11,331 feet



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Why Save a Tree?

Sustainability is a process, not a destination. To be sustainable means to increase responsibility for paper's entire life cycle—from the forest through responsible production and usage to recycling.



What would happen if we lost all trees? One sure thing is that the organisms that live on Earth—including humans—would be deeply affected. Read the table below to find out some of the reasons why.

Mammals	Birds	Insects	Humans
Some mammals, like squirrels and bats, make their homes in trees.	Many birds depend on trees for homes, whether in a hollow tree hole or in nests within a tree's branches.	Many types of insects live under the bark of trees or within leaves. For example, migrating monarch butterflies spend the winter living among trees in the south.	Trees clean the air we breathe by taking in carbon dioxide and giving off oxygen.
Some mammals use trees as a main source of food. For example, deer eat the leaves, twigs, and acorns of trees.	Trees provide food for many birds. For example, woodpeckers eat insects that are trapped in a tree's sap.	Insects depend on trees' leaves, fruit, twigs, and interior tissue for food.	Trees help prevent erosion by holding soil in place with their roots.
Trees offer mammals protection from the weather and from predators on the ground.	Many birds use trees to provide shelter for their young.		Flowering trees provide nectar for insects that are pollinators, such as honeybees.
Mammals use trees to store food. Tree squirrels stash nuts, berries, and fruit in hollow places in trees.	Some species of birds depend on trees as a place to store vital food during the winter.		Shade from trees cools the earth and reduces energy consumption. Trees also make rain fall by releasing water from leaves back into the atmosphere, where it later falls as rain.

On another sheet of paper, write an argument from the viewpoint of a tree. Use the information above to support the claim that humans should work to protect trees.

Extreme Trees

Trees inspire us with their size, length of life, and sheer beauty. Use the chart of extreme trees to solve the problems below.



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Species	Distinction	Extreme fact
Coast redwood	tallest tree in the world	360 feet
Giant sequoia	large circumference at base	112 feet
Montezuma cypress	widest diameter for a tree	38.1 feet
Canyon live oak	large circumference	385 feet
Sugar pine	largest circumference for a pine tree	414 feet
Monterey pine	large circumference for a pine tree	334 feet
European mountain ash	large circumference	121 feet

1. Fill in the chart below. (Hint: Think about how you could use inverse operations to find the diameter and radius when you know the circumference. Also remember that the diameter is twice as large as the radius.)

Tree	Circumference	Diameter	Radius
Giant sequoia	112 feet		
Canyon live oak	385 feet		
Monterey pine	334 feet		
European mountain ash	121 feet		
Sugar pine	414 feet		

2. An Apache pine tree, while not extremely large, has a diameter of approximately 40 feet and a height of 108 feet. Is the circumference larger than its height? How do you know?
3. The tallest tree in the world is the coast redwood. How many inches tall is this record-breaking tree?
4. The oldest tree in the world is a bristlecone pine tree. It turned 4,844 years old in 2013. In what year did this tree first sprout?

Do you ever feel guilty about using paper? While we all want to use resources responsibly, remind yourself that you aren't destroying the forests when you use paper made by companies that have adopted responsible forest management practices. Plus you can give your printed documents a second life by recycling them!



“Extreme Trees”

Answer Key

1.

Tree	Circumference	Diameter	Radius
Giant sequoia	112 feet	35.7 ft.	17.9 feet
Canyon live oak	385 feet	122.5 ft.	61.3 ft.
Monterey pine	334 feet	106.3 ft.	53.2 ft.
European mountain ash	121 feet	38.5 ft.	19.3 ft.
Sugar pine	414 feet	131.8 ft.	65.9 ft.

2. yes; the circumference is 125.7 feet, which is larger than a height of 108 feet
3. 4,320 inches
4. 2831 B.C.

