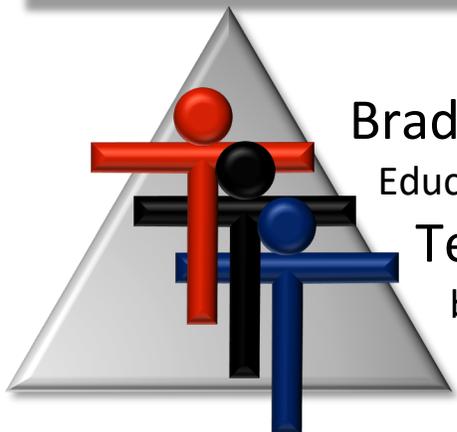


# Identifying Conifers Of the Cascade Range



Includes free  
video link!



**Brad Fulton**

Educator of the Year, 2005

Teacher to Teacher Press

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*Don't be a  
pirate, Matey!*



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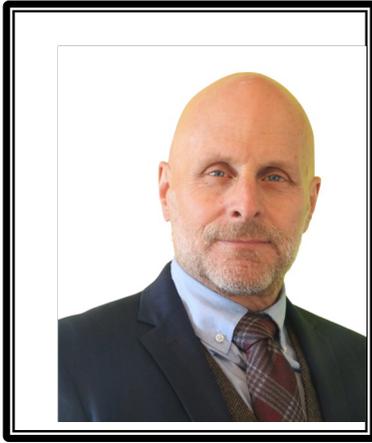
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Thanks.

*Brad*



## Brad Fulton

### Educator of the Year

- ◆ Consultant
- ◆ Educator
- ◆ Author
- ◆ Keynote presenter
- ◆ Teacher trainer
- ◆ Conference speaker

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(530) 547-4687  
brad@tttpress.com

Known throughout the country for motivating and engaging teachers and students, Brad has co-authored over a dozen books that provide easy-to-teach yet mathematically rich activities for busy teachers while teaching full time for over 30 years. In addition, he has co-authored over 40 teacher training manuals full of activities and ideas that help teachers who believe mathematics must be both meaningful and powerful.

#### **Seminar leader and trainer of mathematics teachers**

- ◆ 2005 California League of Middle Schools Educator of the Year
- ◆ California Math Council and NCTM national featured presenter
- ◆ Lead trainer for summer teacher training institutes
- ◆ Trainer/consultant for district, county, regional, and national workshops

#### **Author and co-author of mathematics curriculum**

- ◆ Simply Great Math Activities series: six books covering all major strands
- ◆ Angle On Geometry Program: over 400 pages of research-based geometry instruction
- ◆ Math Discoveries series: bringing math alive for students in middle schools
- ◆ Teacher training seminar materials handbooks for elementary, middle, and secondary school

#### **Available for workshops, keynote addresses, and conferences**

All workshops provide participants with complete, ready-to-use activities that require minimal preparation and give clear and specific directions. Participants also receive journal prompts, homework suggestions, and ideas for extensions and assessment.

*Brad's math activities are the best I've seen in 38 years of teaching!*

Wayne Dequer, 7th grade math teacher, Arcadia, CA

*"I can't begin to tell you how much you have inspired me!"*

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*"Your entire audience was fully involved in math!! When they chatted, they chatted math. Real thinking!"*

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*"Absolutely engaging. I can teach algebra to second graders!"*

Lisa Fellers, teacher

*References available upon request*

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If we make copies for our friends, can we honestly tell our students not to copy or take things that don't belong to them? (Ouch!)



Discounted site licensed copies are available on the TPT website. Please encourage them to take advantage of this affordable option. Okay?

Thanks, and happy teaching,

*Brad* 

## OVERVIEW

### Materials:

- Pictures of the pine cones and needles
- Lab Sheet
- Access to the internet or tree identification materials

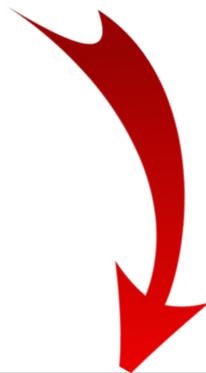
## Identifying Conifers of the Cascade Range

This lab will teach students how to identify evergreen trees found in the volcanic Cascade Range of the Pacific Northwest. The samples are representative of Lassen Volcanic National Park in northern California. Lassen represents the southern terminus of the Cascades and is one of the few places in the world where all the different types of volcanism can be found in one location. Due to its diverse geology, there is a corresponding diversity of conifers in the area. Students will be asked to identify ten different species using the cones and needles as evidence.

## PROCEDURE

1. Ideally, you would want to have pine cone and needle samples of the ten species of trees in this activity. However, since that is not feasible for all teachers, I have included photos superimposed on centimeter and inch scales. (I prefer to use the centimeter scales for my middle school students as this is the standard measurement system for science. However, when they do their research, the data may be in inches.) You may wish to laminate the copies for use with your students.
2. The ten species are:
  - a. Douglas Fir
  - b. Jefferey Pine
  - c. Lodgepole Pine (also known as Tamarack Pine)
  - d. Mountain Hemlock
  - e. Ponderosa Pine
  - f. Sugar Pine
  - g. Western Red Cedar
  - h. Western White Pine
  - i. White Fir
  - j. Whitebark Pine

3. I set up two stations for each species. Students move from station to station in their groups. By setting up two stations per species, there are always more stations than groups, so no one has to wait for another group to finish. Each station has the picture of the cone and its needles on the grid paper. I also have samples of each type of cone for students to handle. Some species, namely the sugar pine, western white pine, and whitebark pine are notorious for having lots of pitch on them. I put these in sealed plastic bags. The white fir and whitebark pine cones are also very fragile. You may wish to have these in plastic bags as well or shrink-wrap them.
4. Provide each student or each group of students with a copy of the Lab Sheet. Explain that there are ten types of conifers represented on their Lab Sheet and ten pictures or samples of them at the stations. You may want to explain what a conifer is and how it differs from other trees. Conifers produce cones and are typically evergreen. Their task is to identify the species of the cones and needles in the pictures.
5. Depending on the skill and experience of your students, you may want to guide them through the process of searching on the internet. For example, you can type “Douglas Fir cone” into a search engine. You can then select an article to reference or select the images option. They can read to find out the length of the Douglas Fir cone which is about 5-7 cm. The Douglas Fir also has single needles. They will notice that the Douglas Fir cone has feathery prickles on the tips of the scales. There is only one picture that has such a cone (Picture G).
6. Give the students time to move from station to station as they research the different species of conifer. When they finish, they can bring their lab sheet to you to be checked. Typically, I tell the students how many are right, but I don’t tell them which ones are right. For example, I may say they have eight correct. That means that two of their species need to be switched. It is up to them to do the research to find out which ones.



**Important Note!**

The cones and needles were photographed on centimeter and inch grids. However, these photos were reduced slightly to fit onto the page. While the photos of the grids can be used to measure the cones and needles, a ruler set against the photo will not be accurate.

7. Here is the key for the Lab Sheet. To simplify checking, notice that reading from the bottom up spells “bad chef jig”.

G Douglas Fir (1)

I Jefferey Pine (3)

J Lodgepole Pine (2)

F Mountain Hemlock (1)

E Ponderosa Pine (3)

H Sugar Pine (5)

C Western Red Cedar (No needles. Cedars have scales.)

D Western White Pine (5)

A White Fir (1)

B Whitebark Pine (5)

8. To extend the activity, you may wish to have the students classify the conifers based on how many needles they have in a bundle. Fir trees have single needled while pines have two, three or five needles per bundle. This results in this classification:

- 1 needle: Douglas Fir, Mountain Hemlock, White Fir
- 2 needles: Lodgepole Pine
- 3 needles: Jeffery Pine, Ponderosa Pine
- 5 needles: Sugar Pine, Western White Pine, Whitebark Pine

Pines with three needles are called Yellow Pines. Five-needled pines are White Pines. Your students may be able to find local pines and firs that fit into these families.

9. You may notice something interesting about the number of needles on pines and firs. If we arrange them in ascending order, we have

1, 2, 3, 5

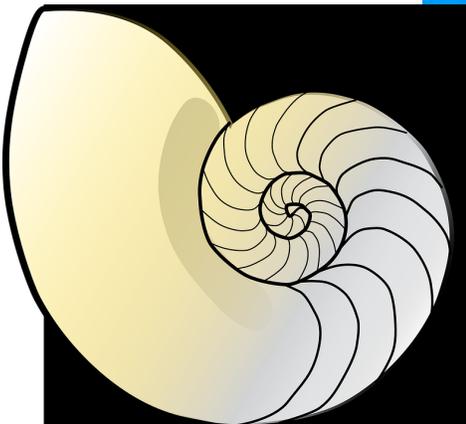
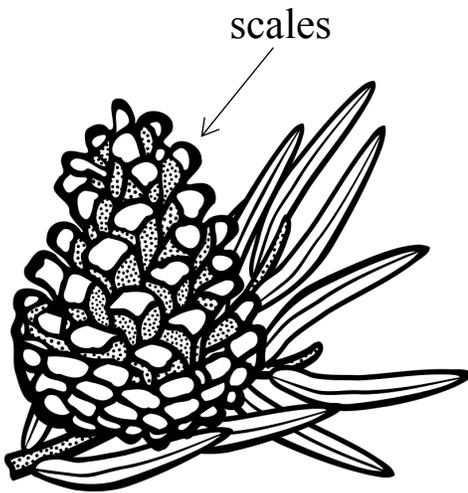
Notice that the first two numbers add up to the third, and the second and third number add up to the fourth. That is,

$$1+2=3, 2+3=5.$$

This pattern of numbers is called the Fibonacci sequence. Fibonacci started with  $1+1=2$  and continued. The pattern goes on infinitely:

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144...

Interestingly, these numbers are often found in nature. Notice that most species of starfish have 5 arms while an octopus has 8. Wild daisies typically have 13 petals – so she will always love you! Sorry, but you won't find many 4-leafed clovers. The spiraled seeds on a sunflower are Fibonacci numbers as well, and even a snail's shell contains a Fibonacci spiral. Your students may notice that the scales of the pine cones are spiraled. Most pine cones have 5 or 8 spirals. If you have a pine cone that is closed fairly tightly, you can count the spirals. In the photo below, the scales have been painted to show the spirals. This white fir cone has 8 spirals in both directions.



10. The pages following the Lab Sheet have photos of the various species of conifers set against grids in both centimeters and inches. As students do their research, measurements may be given in either unit. Use whichever you prefer or print each species back to back with both grids. You could also teach students how to convert between inches and centimeters. 1 inch is approximately 2.54 centimeters.
11. Other pages have photos of some of the trees and of their bark. These may also be useful in identifying the species.
12. I have also included blank inch and centimeter grids if you wish to collect samples from your own region.
13. And lastly, one of my YouTube channels has many videos of my camping and backpacking trips in the Cascade Range and in Lassen Volcanic National Park. Simply go to:

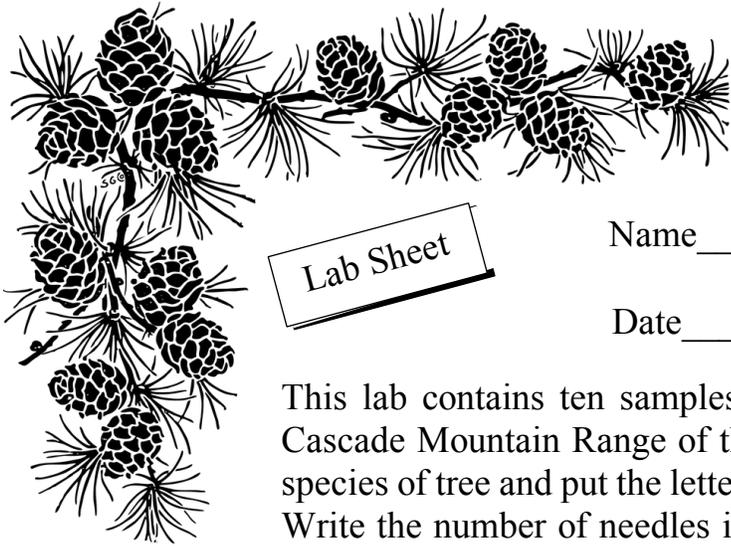
<https://www.youtube.com/user/edconnected/videos>

Once there, I'd suggest these videos:

- Cinder Cone
- Thousand Lakes Wilderness
- Caribou Wilderness
- Cave Campground
- Spatter Cones
- Twin Bridges
- and any of my Pacific Crest Trail (PCT) hikes that feature the Cascades.

Watch a free video of the area in which these cones were gathered at Lassen Volcanic National Park:

[https://www.youtube.com/watch?v=HwV0cI5\\_WnY](https://www.youtube.com/watch?v=HwV0cI5_WnY)



## Conifer Identification Lab

Name \_\_\_\_\_

Date \_\_\_\_\_ Class \_\_\_\_\_

This lab contains ten samples of conifers found in the volcanic Cascade Mountain Range of the Pacific Northwest. Identify each species of tree and put the letter of the lab sample in the first blank. Write the number of needles in the parenthesis. Then write down one clue that helped you identify the species.

\_\_\_\_\_ Douglas Fir ( ) \_\_\_\_\_

\_\_\_\_\_ Jefferey Pine ( ) \_\_\_\_\_

\_\_\_\_\_ Lodgepole Pine ( ) \_\_\_\_\_

\_\_\_\_\_ Mountain Hemlock ( ) \_\_\_\_\_

\_\_\_\_\_ Ponderosa Pine ( ) \_\_\_\_\_

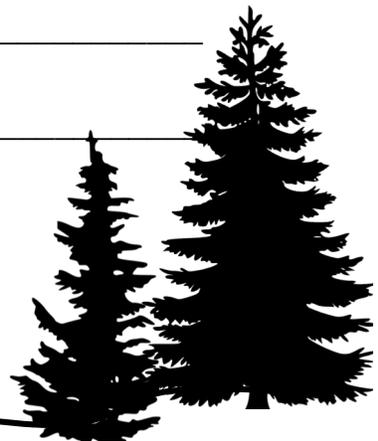
\_\_\_\_\_ Sugar Pine ( ) \_\_\_\_\_

\_\_\_\_\_ Western Red Cedar ( ) \_\_\_\_\_

\_\_\_\_\_ Western White Pine ( ) \_\_\_\_\_

\_\_\_\_\_ White Fir ( ) \_\_\_\_\_

\_\_\_\_\_ Whitebark Pine ( ) \_\_\_\_\_



A



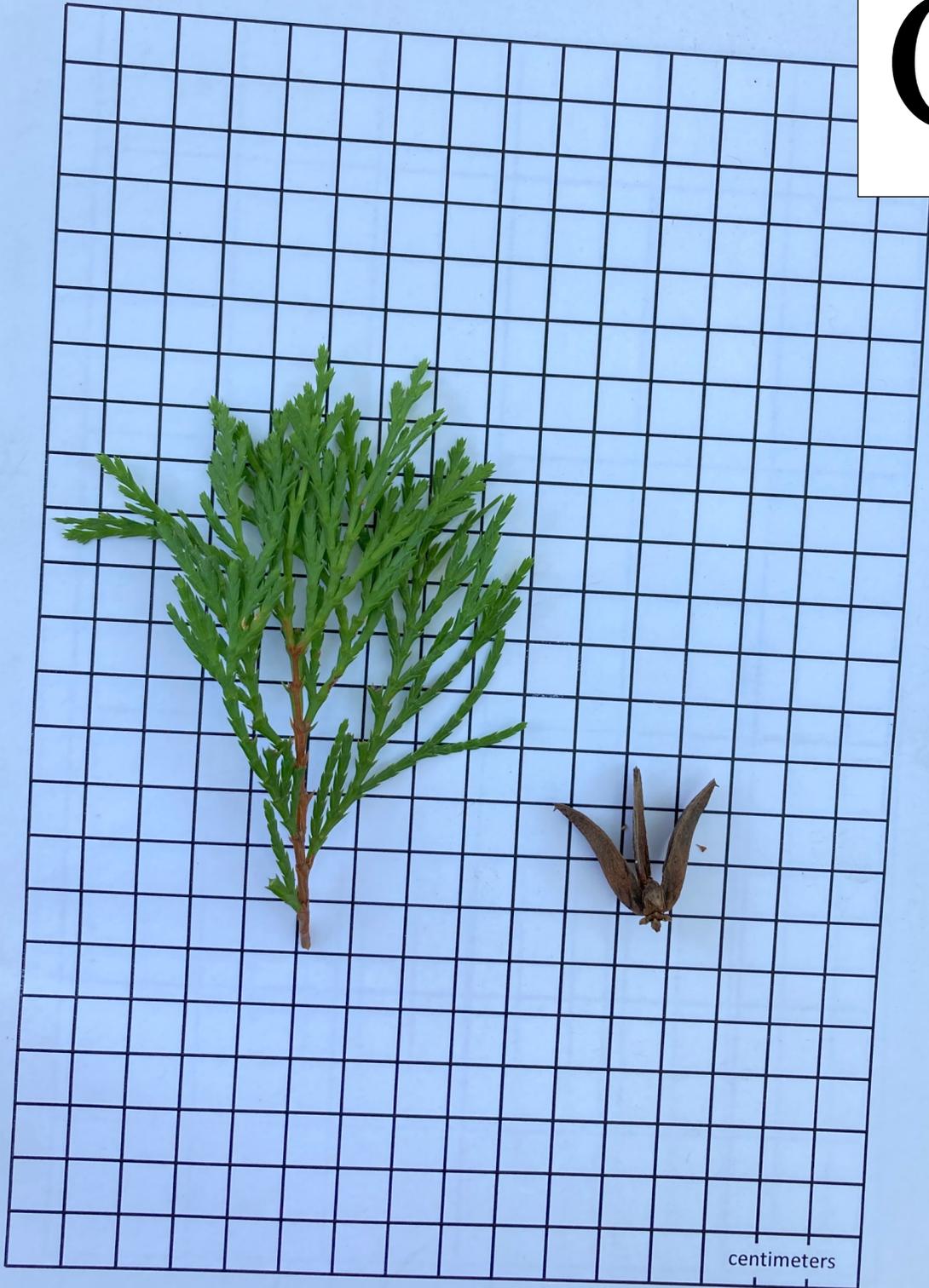
centimeters

**B**



centimeters

C



D



centimeters

E



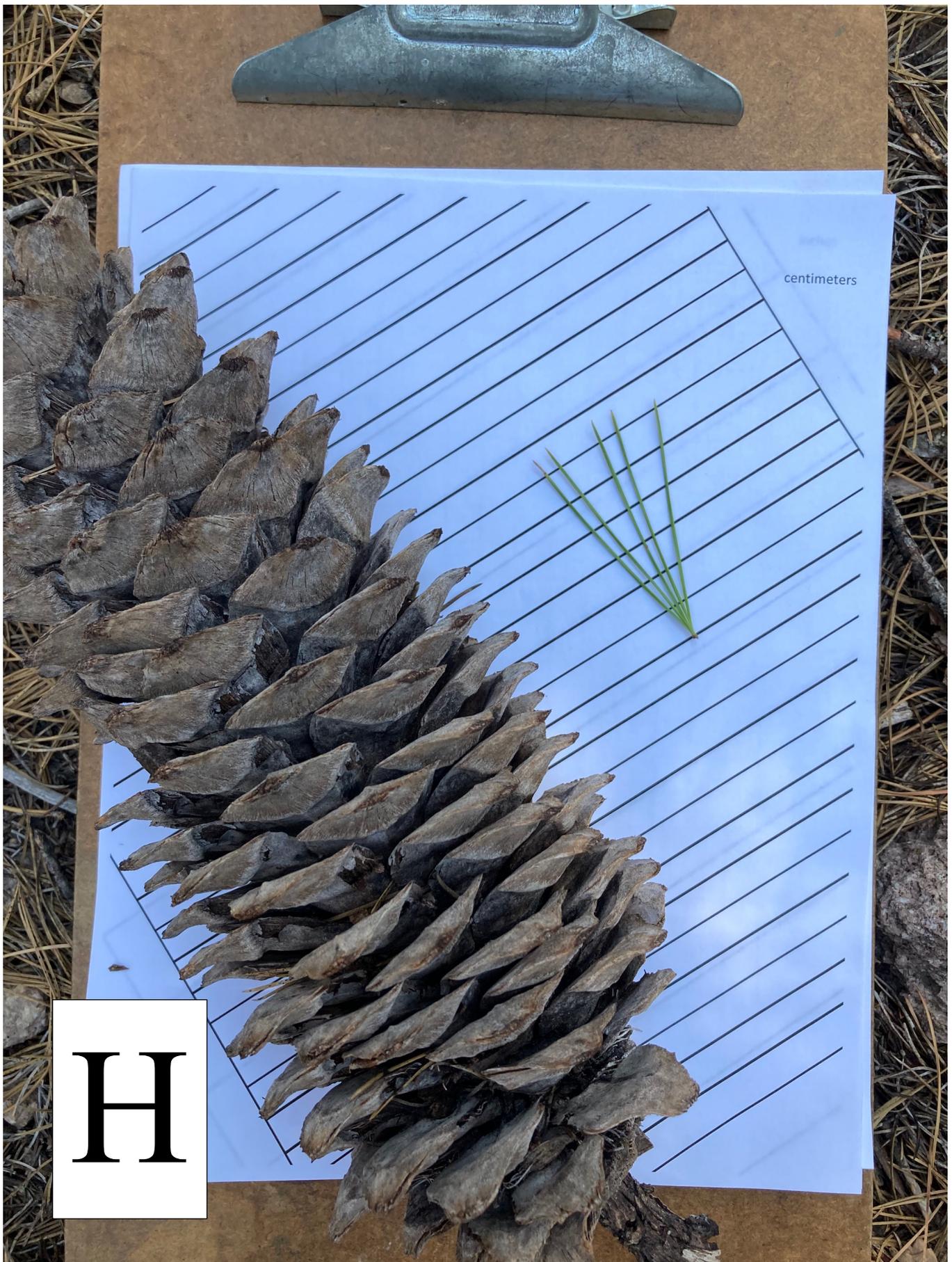
F



centimeters

G





I



centimeters

J



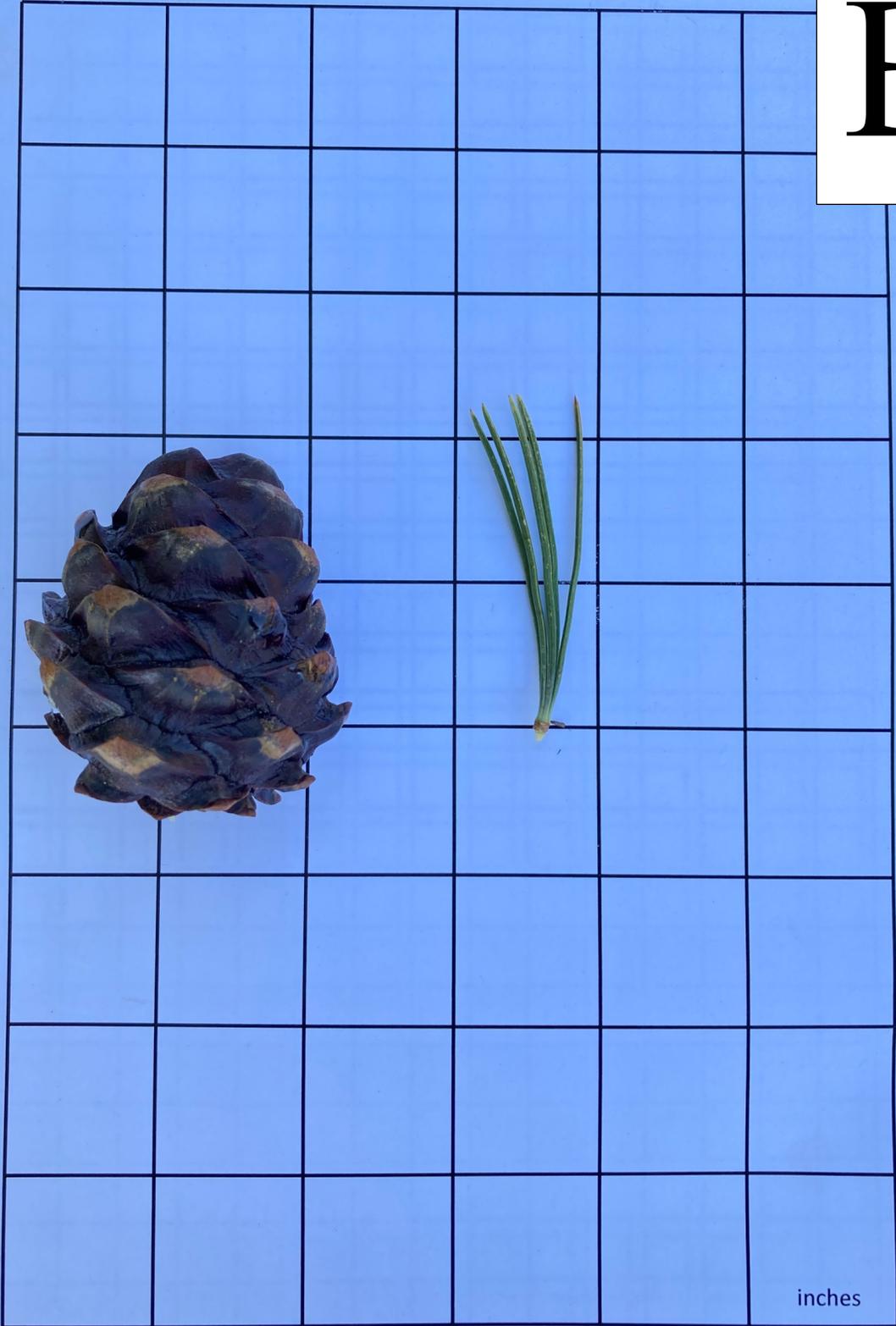
centimeters

A



inches

B



C



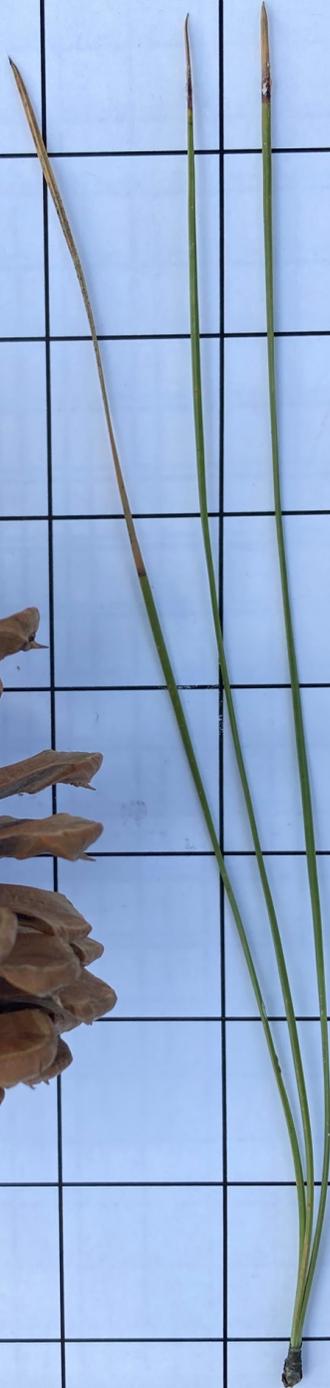
inches

D



inches

E



inches

**F**



inches

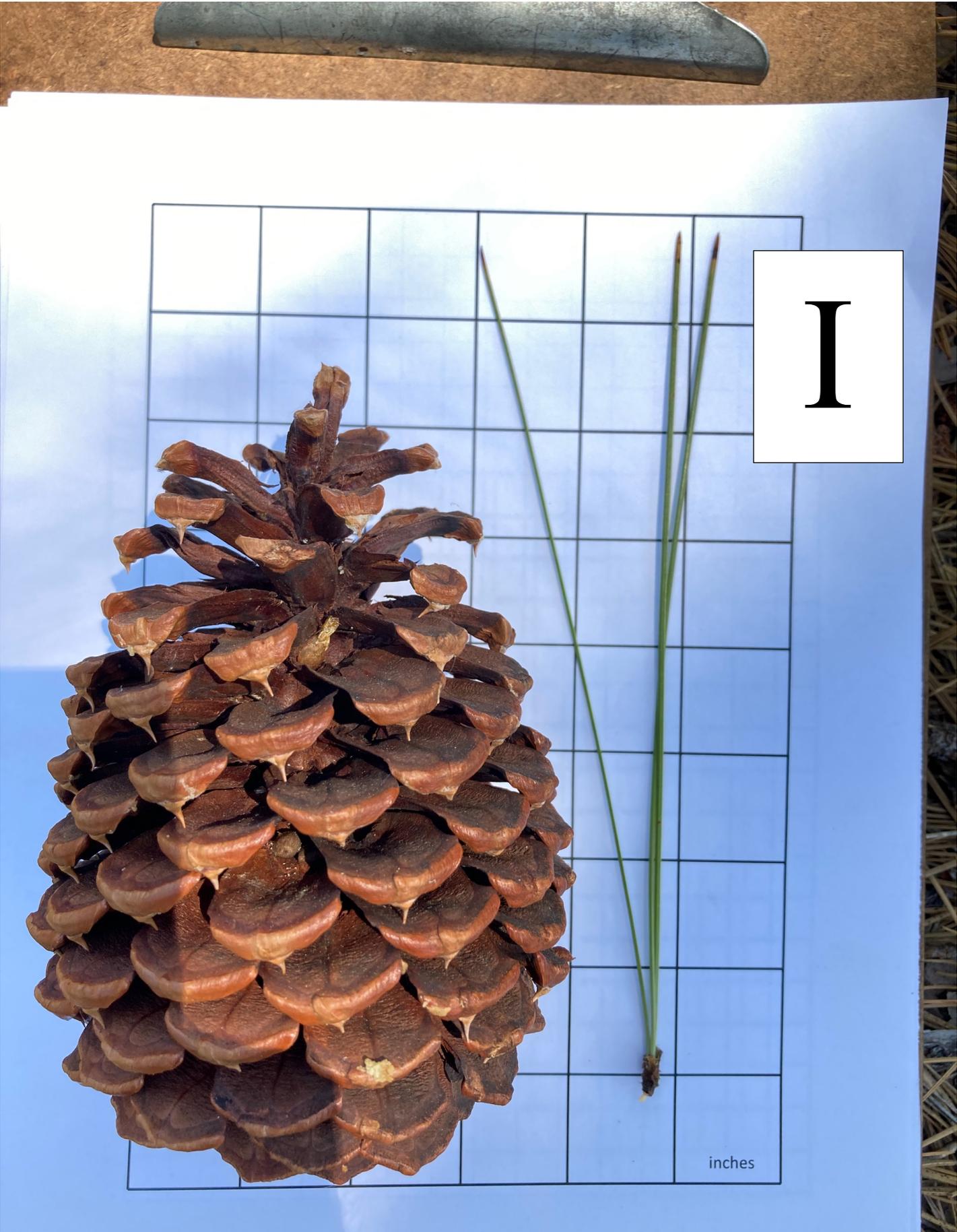
G



inches



I



J



inches



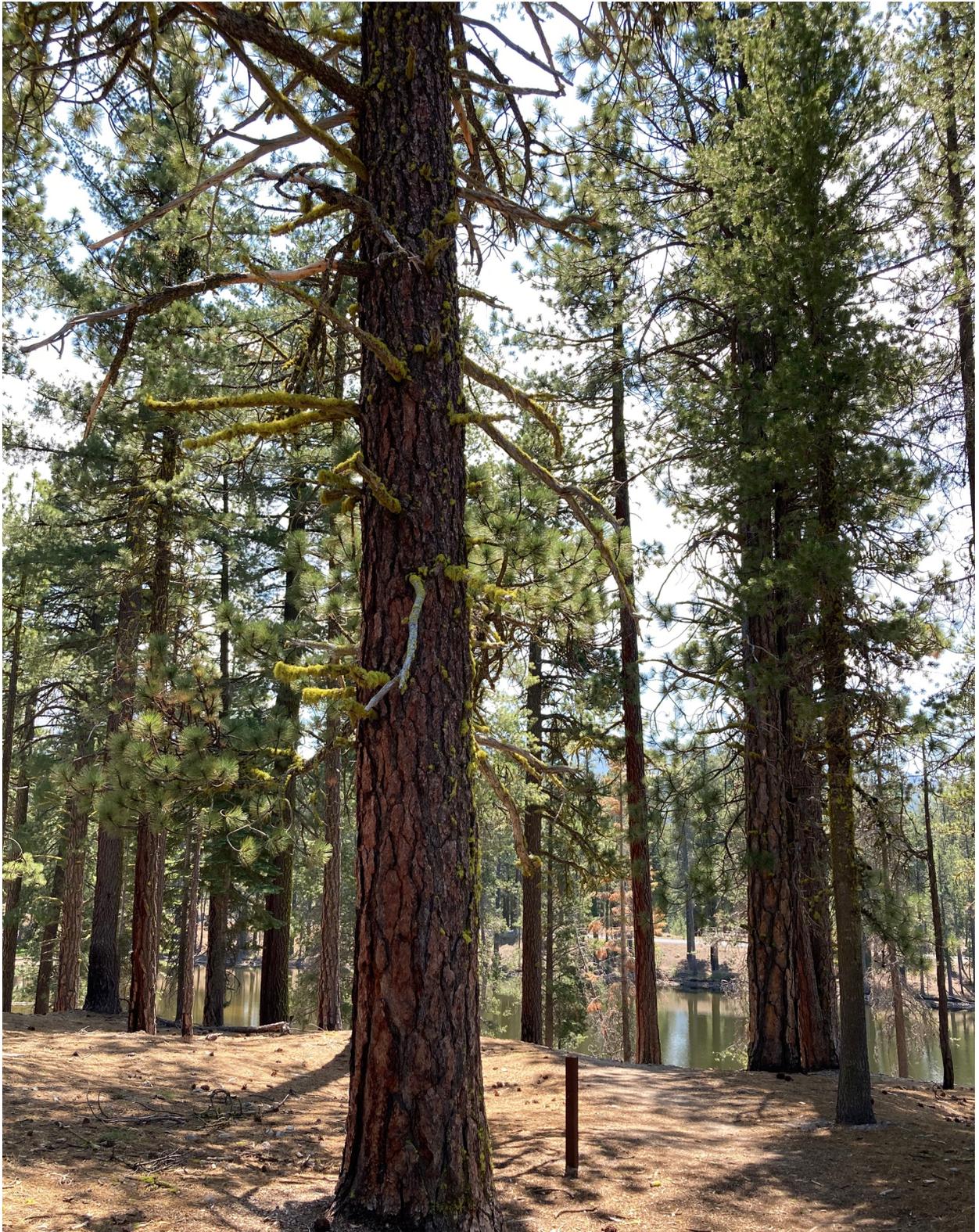
# Cedar bark



# Mountain Hemlock



# Jefferey Pine bark



# Jefferey Pines



Lodgepole bark



# Lodgepole Pines



Ponderosa Pine bark



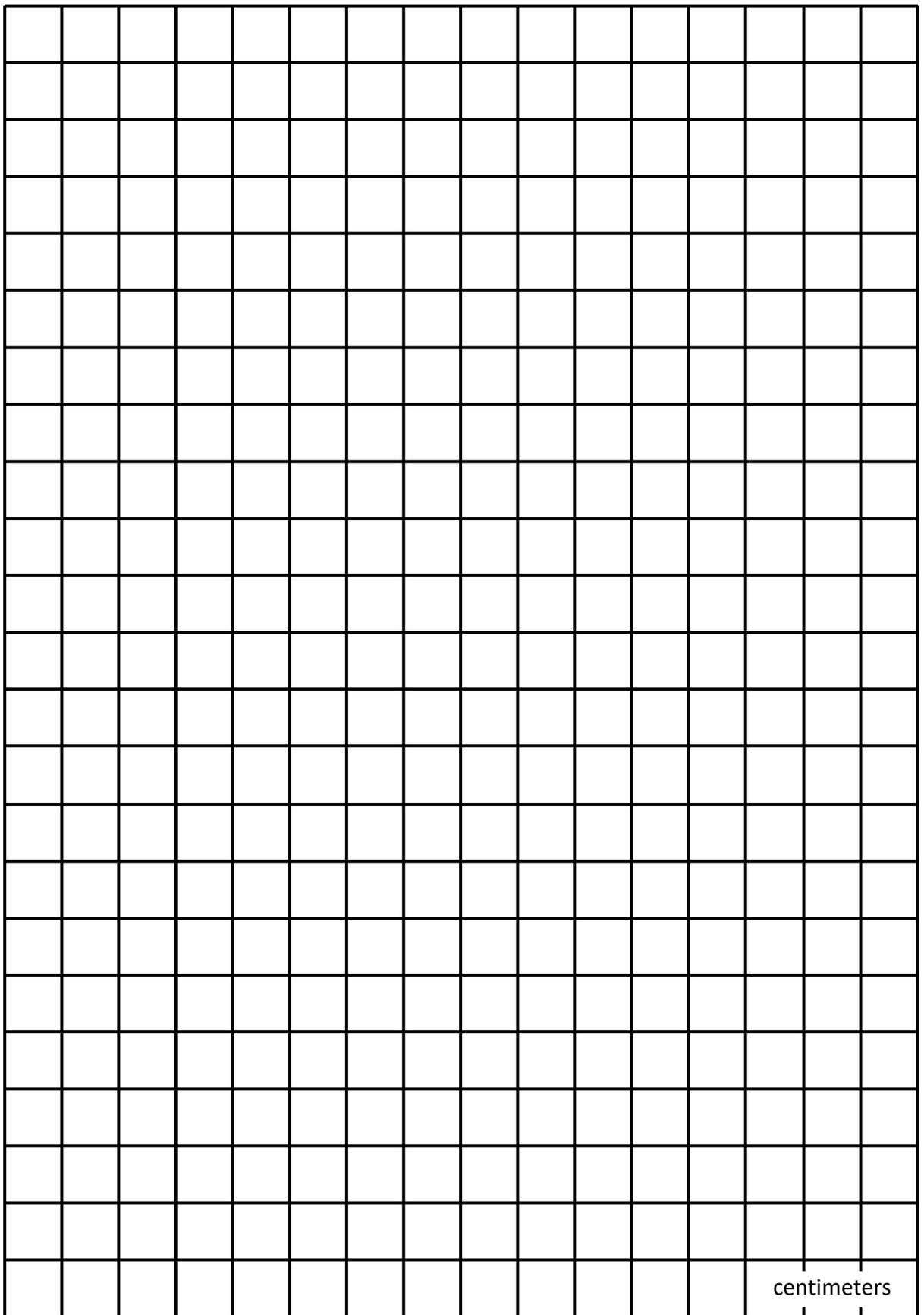
# White Fir bark

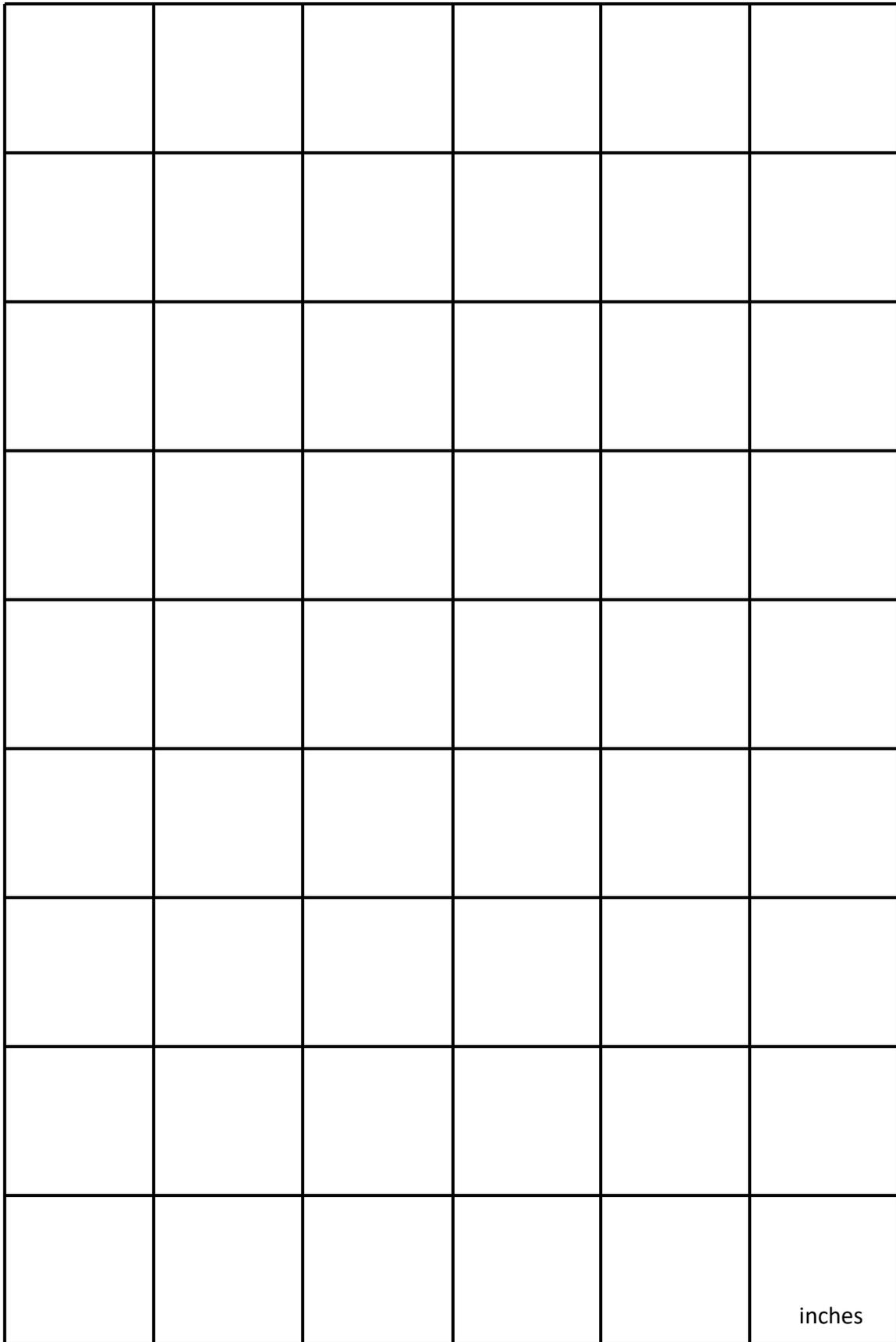


# Whitebark Pine



# A variety of cones at Lassen Volcanic National Park





centimeters

inches

If you liked this activity, you might also like some of the other lessons available in my Teachers Pay Teachers store. Simply scan the QR code on the right.



You can also find many free and inexpensive resources on my personal website, [www.tttpress.com](http://www.tttpress.com). **Be sure to subscribe to receive monthly newsletters and FREE activities.**

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- *Drop Zone: Parachute Lesson* - Another engaging lesson that is highly adaptable and contains all the elements of science, technology, engineering, and math.
- *Ramp Races* - An engaging and exciting way to teach students the principles of physics: forces, motion, speed, friction, and more!

Feel free to contact me if you have questions or comments or would like to discuss a staff development training or keynote address at your site.

Happy teaching,

*Brad*