



## 13. Tree Identification: Figure out the “Mystery Trees”

**Lesson Overview:** In this activity, students observe and record information on botanical specimens, then use each other’s observations to identify 12 tree species that live in Sierra Nevada montane forests.

**Lesson Goals:** Increase students’ understanding that trees have characteristics unique to each species and these can be used to identify them.

**Objectives:** Given descriptions of individual tree species written by their peers, students can examine a sets of photos and botanical specimens to identify a tree species.

**Subjects:** Science, Mathematics, Writing, Reading, Speaking and Listening

**Duration:** Two half-hour sessions

**Group size:** Whole class, working in 12 teams

**Setting:** Classroom

**New FireWorks vocabulary:** *bundle, scale*



Standards:		6th	7th	8th
<b>Common Core ELA</b>	Reading: Informational Texts	4,7,10	4,10	4,10
	Speaking and Listening	1,6	1,6	1,6
	Language	1,2,3,4,6	1,2,3,4,6	1,2,3,4,6
	Reading: Science and Technology	3,4,7,9,10		
<b>NGSS</b>	Matter and Energy in Organisms and Ecosystems	LS2.A,		
	Growth, Development, Reproduction of Organisms	LS1.B		
	Natural Selection and Adaptation	LS4.C		
<b>EEEEGL</b>	Strand 1	A,B,C,E,F,G		

**Teacher Background:** A wildland ecosystem is characterized by diversity. The diversity of tree species is an important characteristic of forests and contributes to the kinds of fire that occur there. To understand the complexity of fire’s role in forests, students must be able to distinguish among tree species. In this activity, they use their observation skills to describe and identify 12 important trees in the Sierra Nevada. They work in 12 teams, since there are 12 species represented in the “Mystery Trees” materials.

This activity has two steps. In the first, students describe a “known” species and record their observations on a handout. In the second, which is also the Assessment, they use each other’s observations to identify ALL of the species.

If you can visit a forest with the class, they can use the same set of handouts to identify trees in the field. (However, note that a winter visit could prove frustrating if deciduous trees have already shed their leaves.)

If you’d prefer to do a tree identification activity in one class period that uses a dichotomous key, use elementary activity: [E10\\_MysteryTrees](#).

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### Materials and preparation:

- Print a copy of **Handout M13-1: Description of a Tree Species** for each team (12 copies if identifying all 12 trees).
- If possible, provide some field guides for students to examine at the end of the activity. A good resource is *Pacific Coast Tree Finder: A Pocket Manual for Identifying Pacific Coast Trees* by Tom Watts.
- Assemble 12 stations in the classroom, each containing a box or grocery bag with the following items for a single species:
  - Tree Bark/trunk specimen
  - Cone or flower specimen
  - Foliage specimen
  - Set of photos of the species (available: [M13\\_TreePhotoPacket.pdf](#), print double sided)
  - Species name label (available: [M13\\_Labels.pdf](#), laminate & cut each species into own label)
  - Ruler
- See below: “DURING A BREAK OR BEFORE THE NEXT CLASS” for preparation instructions for Step 2 of the activity.

### Procedure: STEP 1 – FIRST CLASS SESSION – “KNOWN SPECIES”

1. Ask: Can you name any tree species that live in the Sierra Nevada? When you see a tree in the woods or on a mountainside, how do you know what kind it is – that is, how can you identify it? **Open-ended discussion. You could note species names a 1-2 characteristics on the board.**
2. Explain: This activity will add to your skill in identifying trees. Each team will describe a tree species using the specimens and photos at one station. Then in the next class, we’ll use your descriptions to identify ALL of the specimens we have here – 12 species in all. **YOU HAVE TO DO A GOOD JOB WITH YOUR DESCRIPTION TODAY SO EVERYONE ELSE CAN USE IT CORRECTLY TO IDENTIFY THE “MYSTERY TREES” TOMORROW!** By the time you’ve honed

your observation skills and used them to identify tree species here in class, you'll be able to identify the same species in the woods.

3. Assign a team of students to each station. Instruct them to record the species name at that station on **Handout M13-1: Description of a Tree Species** and then fill out the handout with their observations on that species. They should NOT put the species' code letter on the handout! When they have completed the handout, they should let you know and you'll check their work. Remind them that neatness counts because they will use other teams' handouts in the next class period.
4. As each team completes the handout, visit their station. Remove the species name label. Make sure the code letter is NOT on the handout. Check the handout for completeness and accuracy. Ask the team to revise it, if necessary, so it will be useful for other students in identifying mystery trees.
5. After you approve the team's handout, collect it for copying. If you are not going to do Step 2 right away, have them place their specimens back in the box or bag.

#### **DURING A BREAK OR BEFORE THE NEXT CLASS:**

Make a set of booklets containing all 12 handouts so you can give a copy to each student or team, depending on how you want to do Step 2. A cover page for the booklet is provided at the end of this activity (***Mystery Tree Booklet, Sierra Nevada Montane Forests and as a separate file: MysteryTreesBookletCover***).

#### **Assessment: STEP 2 – NEXT CLASS SESSION – “MYSTERY TREE SPECIES”**

1. Set up the stations again – this time without species name labels.
2. Give a copy of the Mystery Trees Booklet (their completed handouts for all 12 species) to each student or team.
3. Explain: Each station contains a "mystery tree." You should recognize the one your team described, but the others may be “mysteries” for you. Circulate from station to station in any order. Use the observations in the handout booklet to identify each tree. **Then write the tree's one-letter code in the upper right corner of the correct handout page and circle it.**
4. After the activity is complete, explain that only 12 species are included in this activity, but there may be many more native trees in the forests of your area. Thus you can use this booklet to identify trees in the field, but you'll probably find some in the field that you can't identify. That's what local *field guides* are for. If possible, show them some field guides from a library or another collection.

**Evaluation:**

Code letters for the tree species:

Baker cypress	A
California black oak	C
California red fir	S
Canyon live oak	P
Douglas-fir	E
Incense-cedar	J
Jeffrey pine	K
Ponderosa pine	Q
Quaking aspen	B
Sierra lodgepole pine	M
Sugar pine	T
White fir	X

Full Credit	Partial Credit	Less than Partial Credit
-Student/team correctly identified 10-12 species	-Student/team correctly identified 7-9 species	-Student/team correctly identified fewer than 7 species

# Handout M13-1: Description of a Tree Species

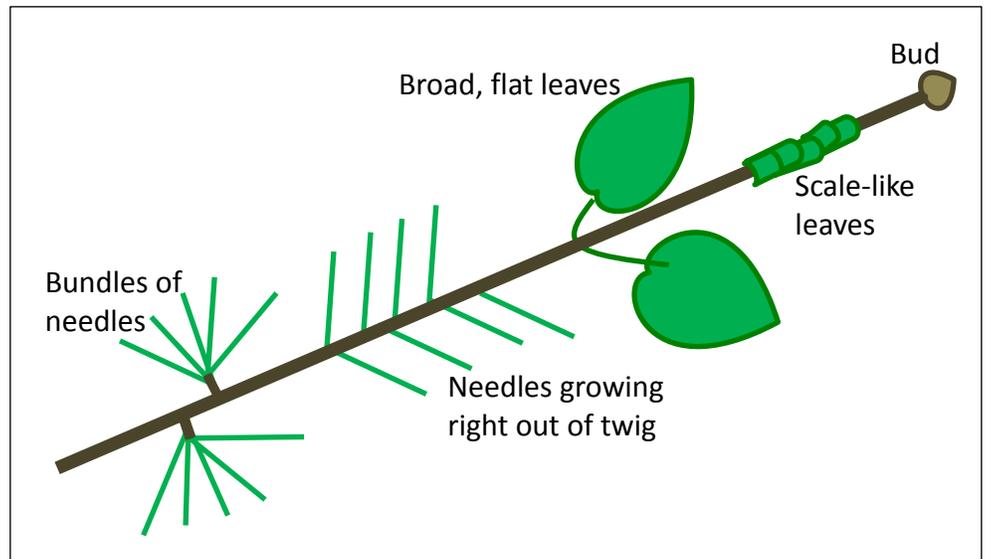
Team Members: \_\_\_\_\_

1. Are the leaves *broad and flat* (more than 1 centimeter wide)... or *narrow and needle-shaped*... or *a long series of overlapping scales*? \_\_\_\_\_

2. How big are the leaves? \_\_\_\_\_ centimeter(s) long by \_\_\_\_\_ centimeter(s) wide

3. If the leaves are NOT scales, do they grow in bundles or individually right out of the twig?  
\_\_\_\_\_

4. Find the biggest bud. This is at the tip of the twigs. How big is it?  
\_\_\_\_\_ centimeter(s) long by \_\_\_\_\_ centimeter(s) wide



5. Do the buds have pointy tips or rounded tips? \_\_\_\_\_

6. Does the tree put its seeds in flowers or cones? \_\_\_\_\_

7. Describe the flowers, seeds, or cones — size, color, how they look:

8. How thick is the bark? \_\_\_\_\_ centimeter(s)  
Describe the bark:

9. Do the branches reach from all the way from the treetop to close to the ground (view the photos)? \_\_\_\_\_

10. Describe two other characteristics that would help someone identify this tree:



# Mystery Trees Booklet

Sierra Nevada Montane Forests

Name(s): \_\_\_\_\_

1. Use the descriptions in this booklet to identify the tree species at each station.
2. Write the correct code letter for each species in the upper right corner of each page (Handout M13-1: Description of a Tree Species)
3. Circle the code letter so it's easy to see.