



Science Unit: *Temperate Forest*

Lesson 9: *Tree Birthdays**

School year: 2004/2005
Developed for: Lord Selkirk Annex Elementary School, Vancouver School District
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Grade level: Presented to grades 1-2; appropriate for grades 1 – 5 with age appropriate modifications.
Duration of lesson: 1.25 hours
Notes: *This lesson is based on B.C. Ministry of Forests. Forests in Focus, p. 89-92. "Counting Birthdays"

Objectives

1. Learn about tree growth: each year a tree produces an annual tree ring. By counting the rings, we can learn the age of a tree.
2. Students will learn about tree parts, including bark, phloem, cambium, sapwood, xylem, and heartwood, and their specific functions.
3. Students will also do increment bores (annual rings) of their own lives with one ring for each year.

Background Information

Trees from temperate regions produce new wood in spring and summer only. Spring wood is lighter and growth is usually greater. During summer months, when there is less moisture, summer wood is denser and rings are darker. A light ring and adjacent dark ring represent one year of growth and together make up an annual ring. By counting rings from a cross-sectional tree disc, one can determine the age of a tree. Annual growth rings vary in width, depending on moisture, light and space availability, as well as soil conditions, insect and fungal attacks and fire.

Vocabulary

Bark: Outermost layer of stem (trunk), made of dead cells, which protects inner parts of a plant.

Phloem: Layer of cells inside the bark which act as tubes, carrying sugar (sap) made in leaves, to other parts of a plant.

Xylem: Tube cells which carry water and dissolved minerals from roots to leaves in a plant.

Cambium: Only growing layer of (stem) trunk which produces new phloem and xylem cells in a plant.

Sapwood: The younger outer layer of wood in tree trunk, containing xylem cells for carrying water and minerals from roots to leaves.

Heartwood: Oldest, inner layer of wood in tree trunk, made of inactive xylem cells, giving the tree strength and rigidity.

Roots: Underground part of a plant which anchors it to the ground and absorbs water and minerals from soil.

Trunk: Main stem of a tree.



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Crown: Branches, twigs and leaves of a tree.

Materials

- Tree discs (cut from small tree of approx. 20 yrs of age, one for each student) or photocopies of tree discs
- Magnifying glasses
- Large tree disc for demonstration

In the Classroom

Introductory Discussion

1. Discuss how we measure the age in people. How do we tell the age of a plant? Discuss differences between short-lived plants (annuals – lettuce, tomatoes) with long-lived plants (perennials - Douglas Fir trees – up to 1000 years old). What does a young plant look like, and an old plant? A young forest, or an old forest?
2. Introduce concept of aging trees by counting annual rings. We will age some trees by looking at slices of a tree trunk. All these tree discs came from trees knocked down by the wind or dead from insect/fungal attack.
3. Show parts of tree on large tree disc, including bark, phloem, cambium, sapwood (xylem), and heartwood. Use a large labeled diagram for clear explanation.
4. Briefly discuss functions of tree parts.

Science Activity/Experiment

5. Each student chooses a tree disc and ages their tree. They can examine bark, sapwood and heartwood of their tree disc. Have students draw and label parts of their tree disc.
6. Students can then do an increment bore of their own lives, drawing one ring for each year. Label birth, important events (birth of siblings, moves, trips, loss of teeth, up to present day).

Closure Discussion

Review parts of a tree, including bark, phloem, cambium, sapwood (xylem), heartwood, and their functions. Review concept of a tree making a new ring each year.

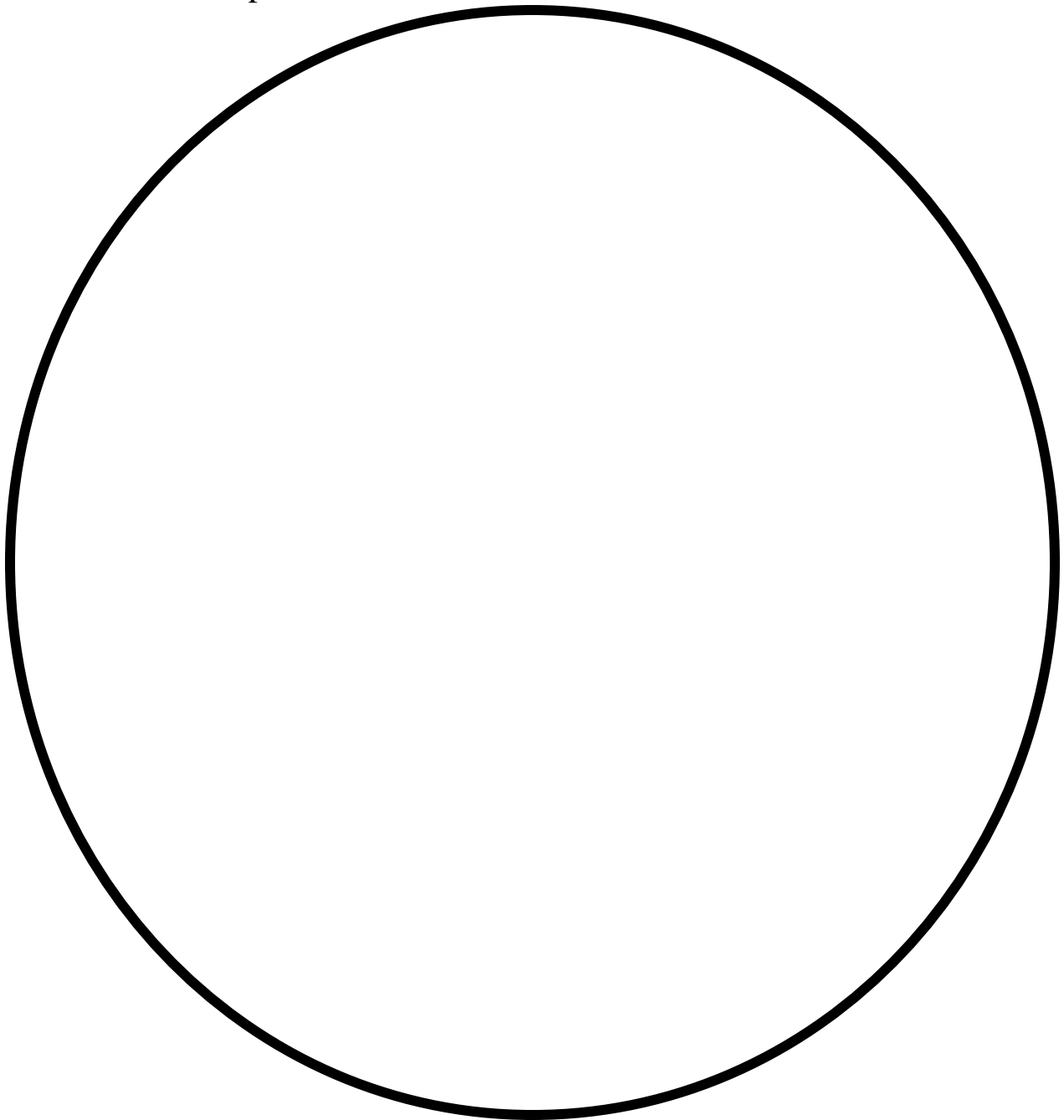
References

7. B.C. Ministry of Forests. 1999. Forests in Focus, Pp. 89-92. ISBN 0-7726-3966-3
8. Burnie, David. 1998. Forest: An Extraordinary Look from the Inside Out. Pp. 14-15. Firefly Books, DK.
9. Gage, Susan. 1998. TRFic: A Temperate Rainforest Teacher's Guidebook and Poster Kit for Intermediate Grades. Pp. 11-12. Sierra Club of British Columbia.
10. Ganeri, Anita. 1993. What's Inside Plants? Pp. 16-21. Peter Bedrick Books. New York.
11. Hickman, Pamela M. 1991. Plantwise. Pp. 48-49. Federation of Ontario Naturalists. Kids Can Press.

Counting Tree Birthdays

Name _____

Draw your tree cookie, with one ring for each year. Draw and label heartwood, sapwood, cambium and bark.

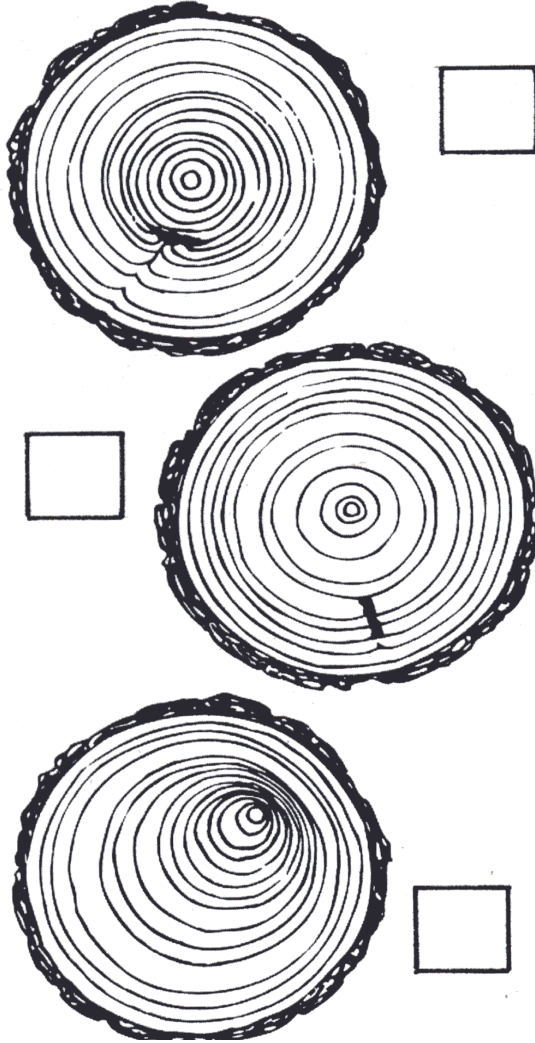


How old is your tree? _____

Counting Tree Birthdays

Name _____

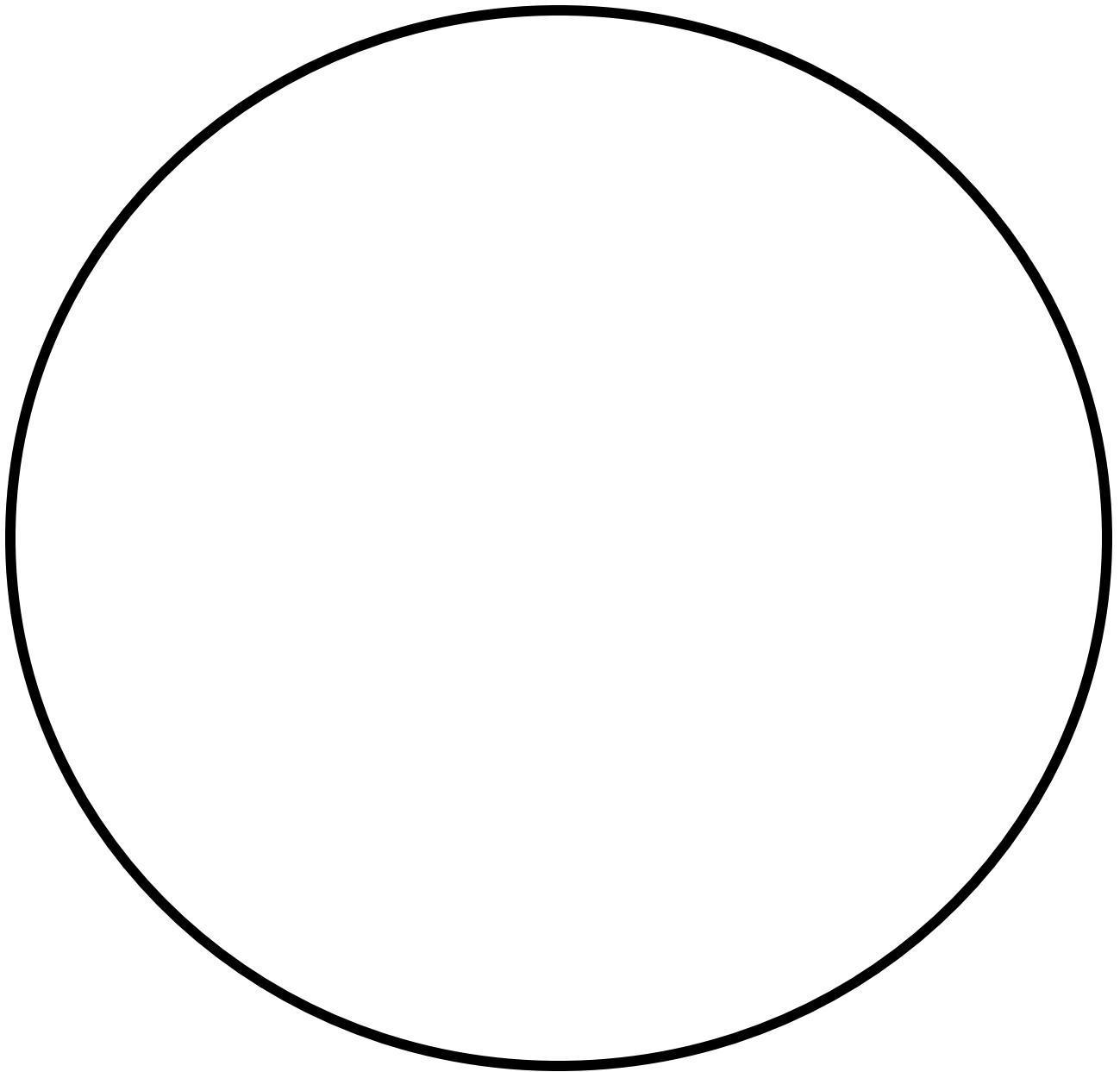
1. How old are these trees?



2. Are there any strange shapes, or patterns on the tree cookie?
What might have caused these?

Counting Your Birthdays Name _____

Draw your life rings like a tree, with one ring for each year. Label important events in your life.



How old are you? _____