Teachers Page

Firewood Lesson Plan

Perhaps the most common biomass we use is firewood. This lesson kicks off with a piece of equipment that makes firewood production look easy – processing up to 10 cords per day.
http://www.youtube.com/watch?v=Hl7wm89PMmE -
firewood cut/split/load 1.5 min

Teams of 3-4 students

Estimated time of 10-15 minutes

Supplies:
Scissors
1 page "wood" for each team
½ page of box (Note – box represents 4 x 8 = 1 face cord) and directions.
Glue or paste suggested but optional

Supplies and Preparation

Computer, projector and access to YouTube (Teacher)

Scissors
Print 1 page "wood" for each team
½ page of box (Note – box represents 4 x 8 = 1 face cord) and directions.
Glue or paste suggested but optional

OR

2 armloads of small diameter firewood
1 plastic crate (milk crate size)
Timer

Directions:
"Using scissors to cut out these "logs", make your own cord of firewood. How much wood can you put in this box? Remember, wood is solid so pieces cannot overlap or go beyond the sides of the box." No other clues. Allow 5-10 minutes for this part of the activity.

Look for these innovative ideas from teams:

- Wood has been "split" to fit more inside box
- Smaller pieces are used to "fill in
- Bark is removed

Discussion:

Have students estimate the numbers of squares that are <u>not</u> covered in wood. The fewer squares, the more firewood.

How much extra effort was needed to cover the most squares?

Would the pieces of real wood fit so easily?

What about branches, curves and knots?

If you were cutting the logs to sell firewood, would you take time to make this extra effort?

**To do this more realistically, bring in an armload or two of a variety of sizes and shapes (rounds, half split, quarter split and smaller) of cut firewood, use a milk crate lying on its side and stack these pieces inside. You need to have a few more pieces than will fit. You could have teams "race" to see how many pieces of wood they can fit in 2 min. - each team member placing 1 piece, taking turns until time is up.

Arithmetic – figure cubic footage of crate and determine what % of a cord fits.

1728 cubic inches = 1 cubic foot

27 cubic feet = 1 cubic yard

Cord is 4' x 4' x 8' = 128 cubic feet = 4.74 cubic yards

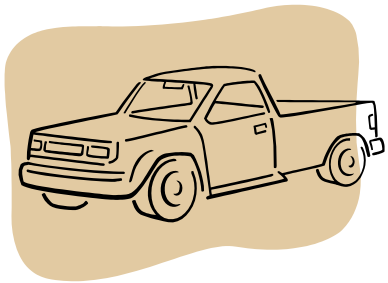
Geometry – fitting shapes to space

Critical thinking, planning, and evaluation -

A dump truck has a 13 cubic yard capacity. How many cords of firewood will it carry?

A large tandem axle dump truck can usually hold approximately 13 cubic yards of material. 13/4.74 = 2.74 cords

A standard pickup truck bed is 8 feet long, 5 feet wide and 2 feet deep. How many cords of firewood can it carry without going above the sides of the truck bed?



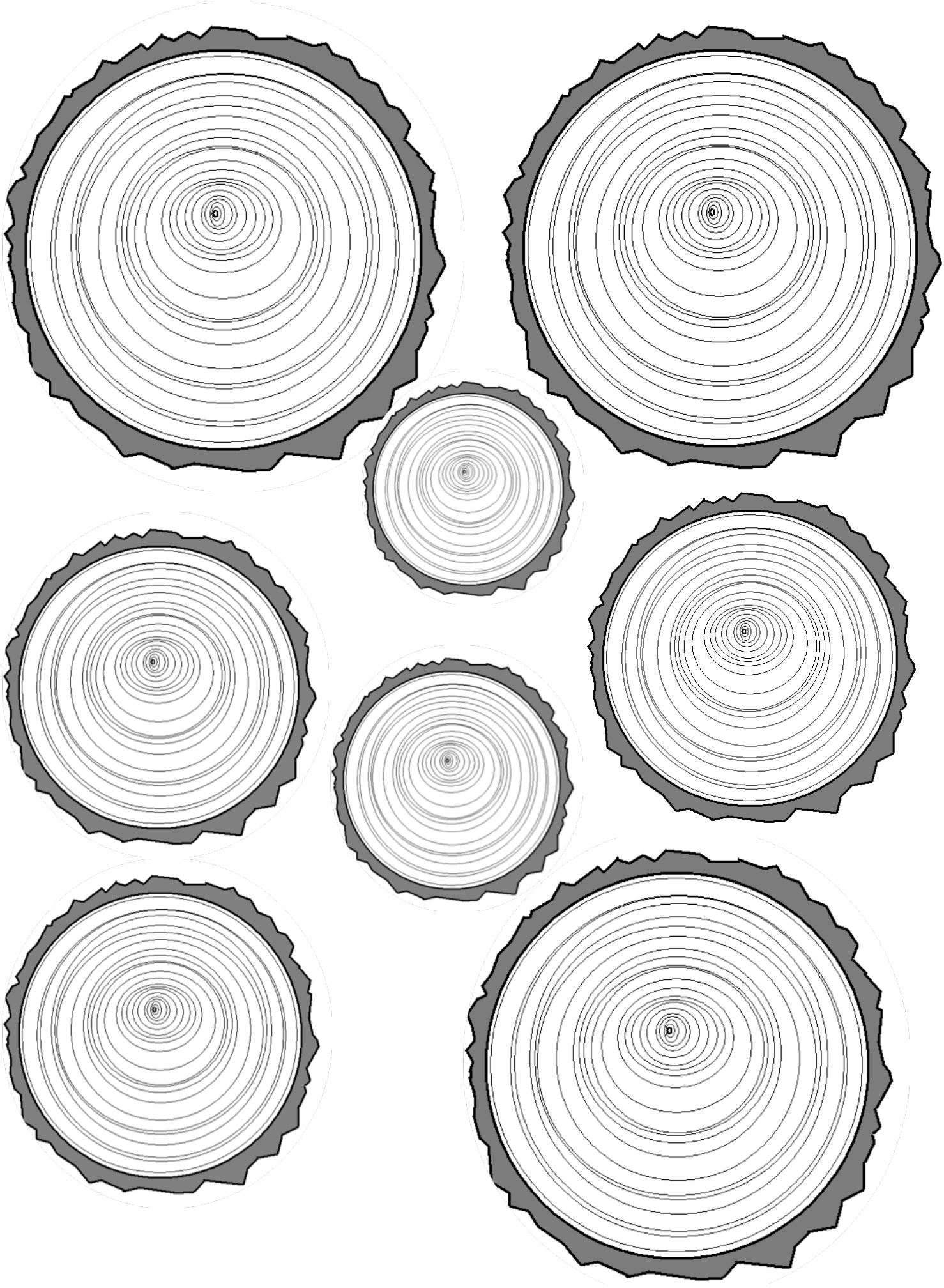
8x5x2=80 cubic feet
80/128= .625 of cord if stacked very carefully

How many trips would the pickup truck have to make to deliver the same amount of wood? 2.74/.625= 4.38

The dump truck driver charges **$140/cord <u>plus $50 delivery</u>**. The pickup truck driver charges **$110 per <u>each load</u>** delivered. Which is a better value?

DT 2.74x140+50= $433.60

PU 110x4.38= $481.80 but is this a trick question? A PU would make <u>5 trips</u> because of partial load so total cost would be $550.00



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