Materials:

- Test work paper
- Calculator
- Calipers
- PVC pipes
- Challenge problem 1
- Warmup 4
- Unit conversion practice
- Area practice problems (optional)

Course Objectives:

- Solve real-world applications involving
- Simplify basic exponential expressio

15 min Warmup 4

a. While students are doing Warmup,
b. Find the area of the entire surface
cross-section that you need
c. Use this same process for CP 1 later

effort (front and back) if assigned for HW
ed, which leaves the

15 min Homework Review (optional—if assigned. Otherwise, go over any requested problems)

a. Ask 7 students to write answers on board
   a. Either put every problem on the
b. Discuss answers and "unit factor"
c. When would using unit factor instead of
multistep conversions

on board
you? To solve

20 min Multistep Unit Conversions Notes

d. Board examples:
   1. **EX 1:** Convert 15 miles to inches

$$15\ \text{mi} \times \frac{5280\ \text{ft}}{1\ \text{mi}} \times \frac{12\ \text{in}}{1\ \text{ft}} = 950,400\ \text{in}$$

   2. **Ex 2:** Convert 6 feet to centimeters

$$6\ \text{ft} \times \frac{12\ \text{in}}{1\ \text{ft}} \times \frac{2.54\ \text{cm}}{1\ \text{in}} = 182.88\ \text{cm}$$

   3. **EX 3:** Convert 60 mph to in/min

$$\frac{60\ \text{mi}}{1\ \text{hr}} \times \frac{5280\ \text{ft}}{1\ \text{mi}} \times \frac{12\ \text{in}}{1\ \text{ft}} \times \frac{1\ \text{hr}}{60\ \text{min}} = 63,360\ \text{in/min}$$

OR ← 8 times

⇒ 6 times

= ← −2 times

4. **EX 4:** Convert 4.1×10^{-8} sec into μs

$$4.1 \times 10^{-8}\ \text{sec} \times \frac{10^{6}\ \mu\text{s}}{1\ \text{sec}} = 4.1 \times 10^{-2}\ \mu\text{s} = 0.041\ \mu\text{s}$$

5. **Ex 5:** Convert 1.2×10^{4} g into μg. Keep in

$$1.2 \times 10^{4}\ \text{g} \times \frac{10^{6}\ \mu\text{g}}{1\ \text{g}} = 1.2 \times 10^{10}\ \mu\text{g}$$

6. Make more examples as needed

e. *On Side of board, write: --Write s during the above examples

Conversion Factors to Know:

25 min Unit Conversion Practice

a. Unit Conversion Practice is in Assignments> Unit 1
b. Students should write on
   i. May choose to them before marking grades
c. May work with groups

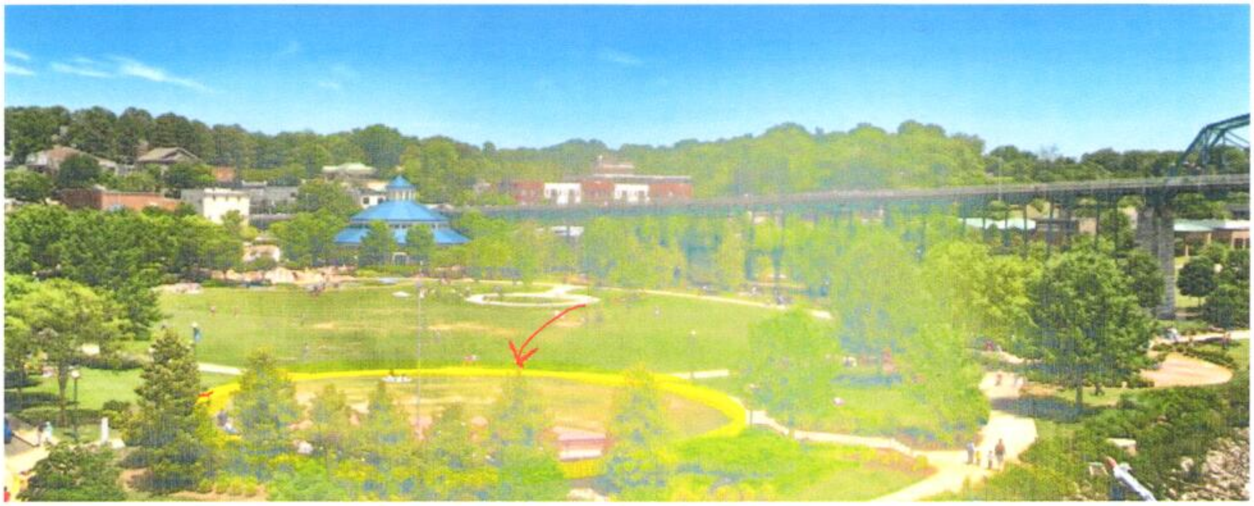
15 min Caliper and PVC pipe activity

a. Each group should collects
b. How accurately can a thousandth of an inch—much more accurate
c. Show how to zero out
d. Measure O.D., I.D, and
e. Can ask for a few sample gives an idea if they are measuring correctly
f. Complete the form on Sheets and Assignments on eLearn (optional)
   i. Results are

25 min Challenge Problem 1—Area of a

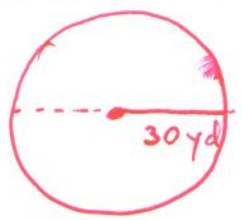
a. Work with partners/groups
b. Students have the tools to section of their PVC pipe (not calculating the area
c. When class needs help,

Warmup 4



square yards ⟹ AREA

1. Your task is to determine ... d to re-sod the interior of the circular sidewalk ... s 60 yd.



$A = \pi r^2$

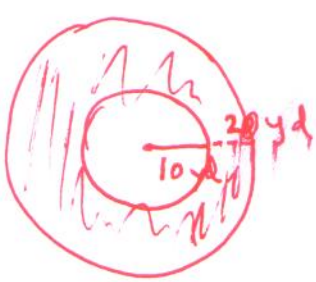
$= \pi(30)^2$

$\approx 2827.43 \text{ yd}^2$

Show how to type in π calc

2. You are planning construction in ... stage is being placed directly in the center of the green ... dius of 10 yds. Now calculate the area of sod needed ... the stage.

Hint: Will need answer from #1 ...



$A = \pi r^2 - \pi r^2$

$= \pi(30)^2 - \pi(10)^2$

$A \approx 2{,}513.27 \text{ yd}^2$

can Type in 1 step

Take area of entire circle. Subtract the area you don't want in answer. leaves what you do want.

SOLN

Unit Conversion Practice

Convert:

1. 1.6 m into mm

$1.6\ \text{m} \times \frac{1000\ \text{mm}}{1\ \text{m}} = 1,600\ \text{mm}$

2. 36 g into kg

$36\ \text{g} \times \frac{1\ \text{kg}}{1000\ \text{g}} = .036\ \text{kg}$

3. 8000 meters into ft.

$8000\ \text{m} \times \frac{100\ \text{cm}}{1\ \text{m}} \times \frac{1\ \text{in}}{2.54\ \text{cm}} \times \frac{1\ \text{ft}}{12\ \text{in}} \approx 26,246.72\ \text{ft}$

4. 86 inches into meters

$86\ \text{in} \times \frac{2.54\ \text{cm}}{1\ \text{in}} \times \frac{1\ \text{m}}{100\ \text{cm}} = 2.1844\ \text{m} \approx 2.18\ \text{m}$

5. 9.3×10^{-5} g into µg

$9.3 \times 10^{-5}\ \text{g} \times \frac{10^{6}\ \mu\text{g}}{1\ \text{g}} = 9.3 \times 10^{1}\ \mu\text{g} = 93\ \mu\text{g}$

both are acceptable

6. 30 ft/sec into mph

$\frac{30\ \text{ft}}{\text{sec}} \times \frac{1\ \text{mi}}{5280\ \text{ft}} \times \frac{60\ \text{sec}}{1\ \text{min}} \times \frac{60\ \text{min}}{1\ \text{hr}} \approx 20.45\ \text{mph}$

7. 1.54×10^{-10} m into mm. Write answer in scientific notation.

$1.54 \times 10^{-10}\ \text{m} \times \frac{10^{3}\ \text{mm}}{1\ \text{m}} = 1.54 \times 10^{-7}\ \text{mm}$

8. Acceleration due to gravity is g= -9.81 m/s^2. Convert gravitational acceleration to ft/ s^2

$\frac{-9.81\ \text{m}}{\text{s}^2} \times \frac{100\ \text{cm}}{1\ \text{m}} \times \frac{1\ \text{in}}{2.54\ \text{cm}} \times \frac{1\ \text{ft}}{12\ \text{in}} = -32.185\ \text{ft/s}^2 \approx -32.19\ \text{ft/s}^2$