Pi Song – Little Help

pi_song.tns

Name _____

Class _____

Pi is used in all sorts of formula. Enjoy the song and explore where π is used in the world.

What would you do with a big ball of string
Roll it 'bout once and it's easy as π
Oh, just divide it by 2π my friends
If you wanted to know just how thick?
Just as long you know the right trick.
Divide the length by 2π my friends.

Problem 1 – C=2πr

When the ball on page 2.1 rolls one complete time, the length it rolls is the circumference. Use C=2πr to determine the radius r. Show how you got the answer.

(Answer the multiple-choice self-check question on page 2.2. When you are on the question, you can check your answer by pressing **menu > Check Answer**.)

Problem 2 – Period of a pendulum

A pendulum bob can be hung from a clock, and it swings because of gravity.
Length of the bob for the perfect tic-toc
Is the square-root of L over g.
Oh, and just times it by 2π my friends

On page 3.2, grab and slide the point for length. Observe the period T, the amount of time to go back and forth, for various lengths.

- Approximate the length of the pendulum for a grandfather clock. (Hint: a tic-toc is actually 2 seconds. Algebra 2 students should show their work in solving the formula for L.)

On page 3.4, press π. This is found to the left of on on the TI-Nspire clickpad. On the TI-Nspire Touchpad press π on the lower left of the keypad.

Press **enter**. Did you get π? To get a decimal approximation of π press **ctrl**+**enter**.

- Record your best approximation for π. _____

If the little pointer finger appears when you cursor over the 3.14 on the right (**ctrl tab** to toggle there), you can press the + and – key to change the precision.

My grades get high with a little help
I can find π with a little help from my friends.

Problem 3 – Intensity

Would you believe that there's π in the lights,
Intensity falls as you move to the right
Oh, and π is in circles my friends
And also in the sound that you hear?
And it's by the area of a sphere.

On page 4.2, grab the slider for the radius or click the value for radius on the slider and change it directly. The radius is the distance from the source of light to the point. Try values like 1, 2, 3, and 4 for the radius.

- What happens to the intensity of light as the distance doubles? Explain how you came to this conclusion.

Extension – $A= \pi r^2$

π can be defined as the ratio of the circumference to the diameter.

It can also be defined as the ratio of the area of the circle to its radius squared.

On the 5.3, use **menu> Measurement>** and **Area** and **Length** to reveal the measurements of the circle's area and the length of the radius. Then use **menu> Actions> Calculate** to find the ratio of the area to r^2.

- When you move the white dot, how does this change the radius? If the radius is increased, what happens to the area of the circle?

- Does the ratio of area to r^2 change? What is it this ratio?