Prep Time, Supply List, and Total Lesson Time

Prep Time:

We recommend 30-45 minutes depending on your expertise level with the content. Each module will vary depending on your previous experience with the content and technology.

Materials:

Each student will need
- their comprehensive and clear experimental design.
- their observation table to collect their data.
- their "Mixing Dilution" handout from the lesson prior.
- access to a computer to view the "Serial Dilution" video (unless you decide to show the video through the class projector unit).
- their homework added to the online collaborative tool.

You will need
- to identify one or two of your students' experimental designs to review with the entire class.
- to post your students' homework to your class's online collaborative tool.

Items Needed to Complete the Experiment
Each student will need:
- a laboratory notebook, preferably separate from their other notebooks
- some method to draw a semilog graph (paper, Microsoft Excel, Google Spreadsheet, etc.)

Each group will need
- 40 ml of stock 3.50% NaCl
- a 50 ml graduated cylinder
- a 10 ml graduated cylinder
- 8 beakers (disposable clear plastic cups will work)
- 8 100 mm petri dishes
- 100 radish seeds (or other garden seeds)
- paper towels
- distilled water
- indelible markers to label the petri dishes
- a ruler
- a pair of scissors

It will be helpful for each group to have
- a calculator
- forceps (to handle seeds and sprouts)
- magnifying glass

Recipe for stock solution: 3.50% (w/v) NaCl solution
- 35.0 g NaCl
- (optional: 20-30 drops of red food coloring per liter)
- 1.00 L H_2O total volume

Teacher Tip: *Do not discard the box that the petri dishes are packed in. After the seeds have been placed into the petri dishes, carefully stack the dishes back into the box so the seeds can incubate in the dark.*

Total Lesson Time:

Lesson Activity	**Amount of Time in Class**
Guided Discussion: Comparing Experimental Designs	10 Minutes
Group Activity: Setting Up the Experiment	35 Minutes
Guided Discussion: Conclusion	1 Minute
Total Time	**46 Minutes**
Lesson Activity	**Amount of Time out of Class**
Video: Acute Versus Chronic Toxicity	5 Minutes
Activity: Pharmaceutical Company Scenario	30 Minutes
Total Time	**35 Minutes**