

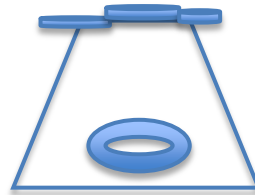
Save Fred!

Partner's sheet

We all solve problems every day – from little problems like what to wear to school, to bigger problems, like whether to get a job or go to college. Different kinds of problems require different problem-solving approaches. One problem can often be solved in more than one way. What do you do when you are faced with a problem?

Materials:

- 1 gummy candy life preserver
- 1 gummy candy worm (Fred)
- 1 plastic cup (boat)
- 4 paper clips



< Fred

< Boat

< Life preserver

Procedure:

1. Set up your materials like the picture.
 - a. Lay the life preserver on the table
 - b. Place the boat (cup) upside down over the life preserver
 - c. Place Fred on top of the boat (cup)
2. Work with your partner to solve the problem below.

Poor Fred! He was sailing along on a boat when a strong wind blew it upside down. Fred ended up on top of the upside-down boat. Unfortunately for Fred, his life preserver is still trapped under the boat.

Your job is to place the life preserver firmly around Fred's body, but you must obey three rules:

- Fred may not fall into the "sea" (the tabletop) more than one time. If he does, Fred drowns.
 - You may not injure Fred in any way.
 - You may use only the four paper clips to move Fred, the boat, and the life preserver. You may not touch anything except the paper clips.
3. Discuss with your partner exactly what your group did to save Fred. Then record this in your subject notebook. You may wish to draw a picture or diagram to explain your procedure.
 4. Explain your procedure to another partnership. Actively listen to their solution, too!
 5. Now think about and discuss this question with your partner:

Humans solve problems in many different ways. In fact, we may use more than one way to solve or tackle a single problem. Here are a few ways that we attack a problem:

- a. Develop a plan
- b. Find a pattern
- c. Draw a picture or diagram
- d. Act out the problem
- e. Make a list
- f. Guess and check (sometimes called trial and error)
- g. Work backwards
- h. Write an equation
- i. Construct a table or a graph
- j. Simplify the problem (by testing with a small number or simpler version first)
- k. Use objects as symbols to model, act out, or test a solution

Which of these ways did you and your partner try? Which were successful? Which might have helped, and how, had you tried them?

Save Fred!

Teacher's sheet

Purpose

Team work, communication, problem-solving strategies, planning, the importance of practice and "Drills" – could be used along with introducing fire, tornado, other safety drills.

Materials

See student sheet – supplies for partners or project groups of up to four (alternative)

Handouts – to share by partner or project group

Have the problem-solving strategies listed on the board or ready to display later via computer/projector.

Procedure

- 1) Have students work with a partner. (Use partner clock partners, perhaps.)
- 2) Introduce the problem to the students.
 - a. Give only the basics, distribute sheets, let kids get supplies and figure it out.
 - b. Go over directions, distribute sheets and materials, ensure understanding, discuss possible strategies or not, specify a planning time or not, etc.
 - c. Give kids time to work. This can be announced beforehand, or not, depending on desired goals/discussion at the end.
 - d. Circulate, noting the different strategies used and by whom. Ask questions in response to kids' questions to you or to their actions that may violate the task's rules:
 - i. Does it say that in the directions?
 - ii. What parameters were you given?
 - iii. Are you violating any of the three rules by doing that?
 - iv. What does your partner say? Do you agree with that?
 - v. What other ideas did you talk about?
 - vi. Have you done everything you were asked to do?
 - vii. Who did you talk with? What did they tell you?
 - viii. Do you believe that the candy was/is clean enough to eat? Safe?
 - e. In the event that a group has a drowning Fred, allow them to begin again with a 2-minute discussion beforehand. OR have one partner use only one hand now as they continue.
- 3) Stop the group, clean up supplies, gather.
- 4) Display strategies and ask a few select individuals to share what their strategies were and what they did/what that strategy looks like.
- 5) Other process questions:
 - a. How effective was your communication with your partner? Were you a good listener or not? A good explainer or not? How do you know? Would your partner agree with you? Why?
 - b. Did/Would having a plan beforehand have helped?
 - c. What about having some "fake Freds" to practice with? Would that have been beneficial? Why/Why not?
 - d. What types of problems do kids your age face that perhaps could relate to this problem?
 - e. What did you learn from this activity that would help you with solving a math (or other types of) problem?
- 6) Distribute one piece of candy to each participant, just for fun.

Alternatives

- Use straight, unbendable toothpicks instead of paper clips.
- Work in different-sized groups
- Work with different parameters as mentioned in 2a, 2b, and 2c.