3.2a What's the Problem? Worksheet

Name: _____

Water in a stream is constantly moving. The water you take from a stream today may not be in the water in the stream tomorrow. There is not enough funding, people, or equipment to monitor our waters at all times. Adverse events such as very low oxygen levels, unusually high temperatures, or pollutants from runoff can harm our streams but are not always captured by water samples.

We want to know the quality of our stream at all times, not just when we are there to take samples. One solution is to use **macroinvertebrates** to identify the quality of our streams, because they live most of their lives in a small area of a stream and cannot escape pollution or other environmental stresses.

Because it is can be hard to identify macroinvertebrates in the field, and because having lots of people in the river can disturb banks and harm riparian vegetation, **we want to design a sampler that will collect macroinvertebrates in the river for us.**

The first task that all engineering teams do when faced with an important project like this is to carefully **define and understand the problem**. Working in your team, discuss each question below to help you better understand and define the problem. These questions have *no wrong answers* so feel free to share your wild ideas with your team and work together.

1. What is the problem we are addressing?

2. What do we want to design?

3. Look back over your notes/worksheets on our stream habitat and macroinvertebrates. What are some habitat features in the stream our collector should mimic?

4. What might be challenges to putting something to collect macroinvertebrates in our stream?

5. List the information your engineering team needs to gather before you can design your macroinvertebrate samplers. List three pieces of information that would be helpful to know.

   a.

   b.

   c.