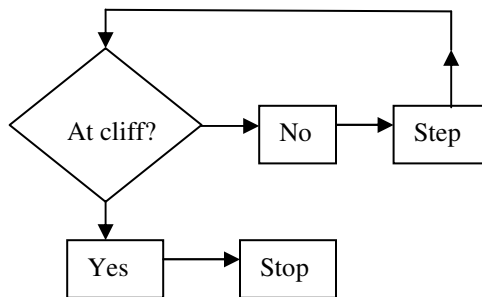Name_____ Period _____ Date _____

Bomb ProBot

STEM Sims

Lesson 2: How to Use a Feedback Loop
In flowcharting, a feedback loop is a set of reoccurring instructions connected to a decision point. Loops save time and space when used properly in a flowchart. For instance, if a robot was twenty steps away from a cliff ledge, a flowcharter could write: step, stop. A loop could be used instead in the following way:

```
              ┌──────────────────────────┐
              ▼                           │
         ╱─────────╲                      │
        ╱  At cliff? ╲──►┌─────┐   ┌──────┐
        ╲           ╱    │ No  │──►│ Step │
         ╲─────────╱     └─────┘   └──────┘
              │
              ▼
         ┌─────┐    ┌──────┐
         │ Yes │──► │ Stop │
         └─────┘    └──────┘
```

Doing the Science
1.   Start the Bomb ProBot Simulation by clicking on the "Sim" tab.
2.   Drag the "kneel" icon to the center of the information processing unit (IPU).
3.   Drag the "probe" icon to the center of the IPU.
4.   Note whether a bomb is present or not.
5.   Drag the "stand" icon to the center of the IPU.
6.   Continue working the robot through the minefield to the "Programming" section by dragging various commands to the IPU. Make sure to avoid all bombs.
7.   Design a flowchart for your commands in the space below.

Flowchart:

Do You Understand?
1.   Are there any parts of your flowchart that could be simplified by using a feedback loop?

2.   If so, redesign your flowchart to include your feedback loop.