Unit 4 - Activity 5
Gravity on Different Planets

Pre-Lab Questions

1. Draw a <u>system schema</u> and <u>force diagram</u> for a person standing on Earth.

2. What is the sum of the forces for this person?

3. If that person is now standing on a bathroom scale, what force is that scale measuring? Explain your reasoning.

4. What is a more common name for the force due to gravity? Let's use this from now on.

5. It turns out the person's weight is 147 N. How could we figure out their mass? Think back to what we learned in the last lab.

6. Now that person is standing on Mars. The gravitational field strength is different there! We know that on Mars they weigh 56.25 N. How could we figure out the strength of the gravitational field on Mars? Explain your reasoning.

General Procedure
Problem: How can we determine the gravitational field strength for all the planets?
Let's use Pyret to simulate the lab we just did on different planets.

In this lab...
What are we changing?_____

What are we measuring? _____

How do we calculate the gravitational field strength?_____

DRAFT

We need a function that takes in the mass and an unknown gravitational field strength and outputs the weight [What's another name for weight?].

Contract+Purpose Statement

Every contract has three parts:

\# _____ : _____ → _____
               Name   Domain   Range

\#
_____
                             What does the function do?

Give Examples

Write examples of your function in action

examples:

_____ (_____)
              the function application…

    is _____
               …which evaluates to

_____ (_____)
              the function application…

    is _____
               …which evaluates to

end

Function

Find the changes in the examples, and name the variables.
Write the code, copying everything that isn't circled, and using names where you find variables!

fun _____ (_____) :

_____

end

Open the starter code at **https://goo.gl/twsxWX** and finish it based on what you have written.

Don't forget to save your work. Click Run and try it out.

Now you're ready to run your experiment!

You'll need a data table for each planet. A blank sample is shown below.

My group's planet:_____

Mass (kg)	Weight (N)

Make a graph of your result and determine the gravitational field strength for your planet.

Discussion Questions

How does your planet compare to other planets tested in the room?

Why do you think the field strength might be stronger or weaker on certain planets?