PROJECT 3 PRELIMINARY PROPOSAL

Here we go again! The goal of this activity is to generate a coherent, feasible idea for your third ModSim project. We suggest you take an approach similar to the activities we've done previously: generate ideas individually at first (perhaps on sticky notes), then, as a team, select or refine these ideas to develop a single proposal by filling in the boxes (once again, please write legibly). This is a *preliminary* proposal; you will create a *final* proposal after the break, which can be an iteration on this one if you choose to continue pursuing this project idea.

1 Question

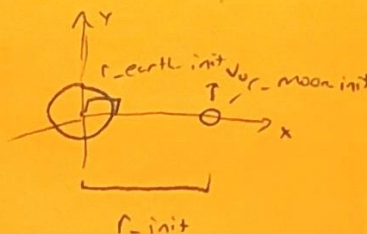What is the motivating question? Why would the answer matter, and who would care?

EK(I) ~~taken way too~~
~~far beyond~~ way too far

How much of earth's moon can we add to the moon before causing it to crash into the earth by the year 2100?
* continuous adding over time

Solving for rate of change of mass

2 Model

How will your model help you answer the question? What are the key elements of the model (e.g., State and System objects)? **Draw a schematic diagram** [with objects, dimensions, forces, and axes]

State:
M_moon
r_moon
r_earth
X_moon   V_x_moon
Y_moon   V_y_moon
m_earth

System:
x_init   double
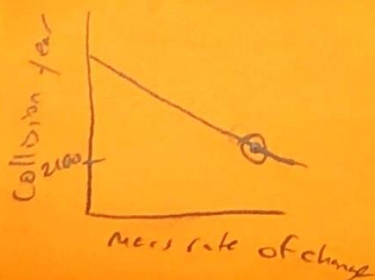G   ?V_rockets

Using Newton's 2nd law general form

$$F + U \frac{dm}{dt} = M \frac{dv}{dt}$$

$$\frac{dv}{dt} = \frac{1}{M_{moon}} \left(F_{earth} + U \frac{dm}{dt} \right)$$
relative velocity

3 Results

What output do you expect the model to produce? Draw at least one graph — be sure to label the axes.

Saturn V rockets /second

4 Interpretation

How do you ex... to answer the...

- look at graph
- pick mass rate of change that makes moon crash @ yr 2100

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