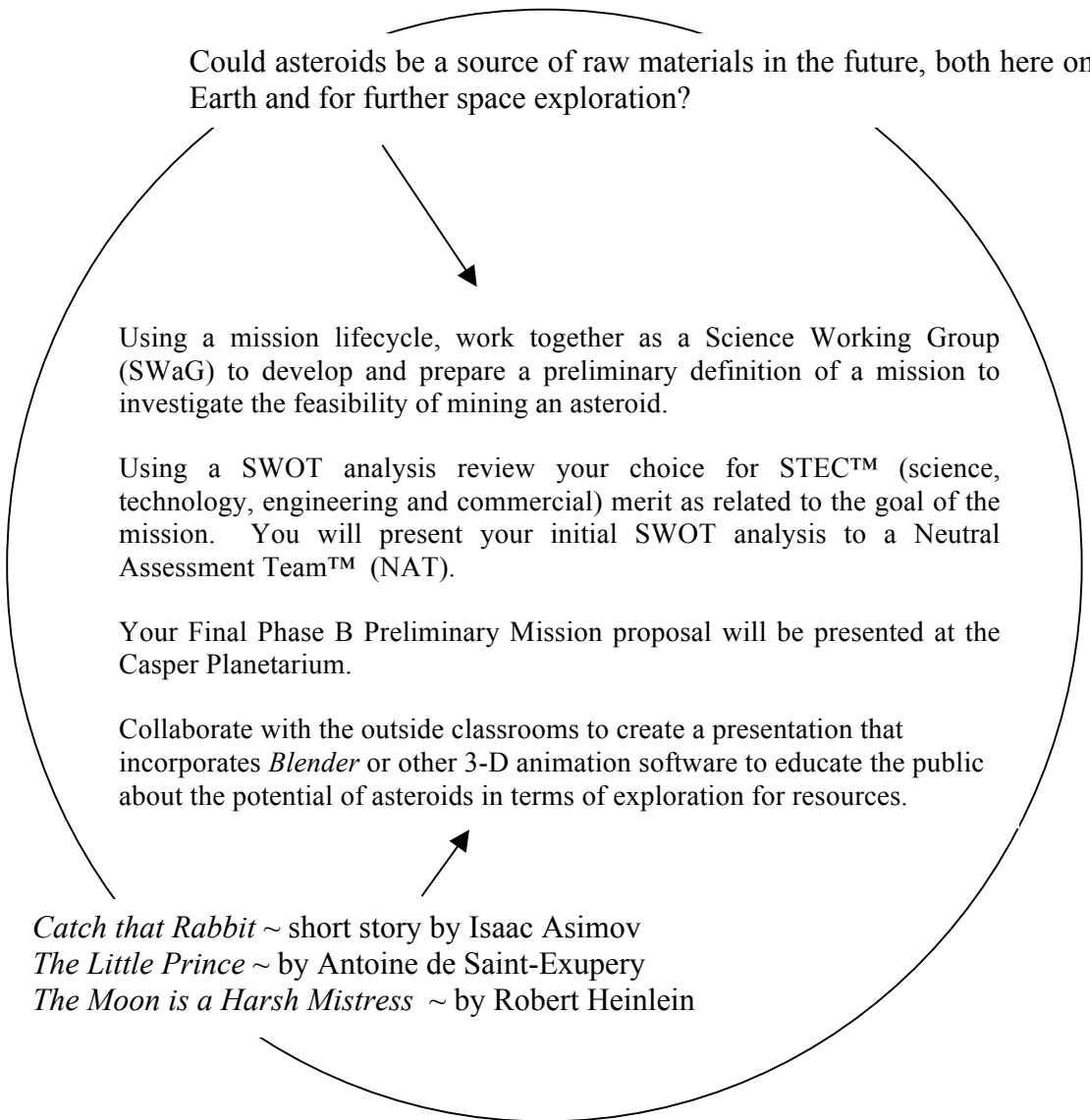


VLASTOS Lesson Plan

~ See page 2 below for the Problem Statement (concept/context of extended ‘lesson’)

Pretest Questions	How can we select a specific asteroid to extract its resources for the betterment of mankind?
Objectives	Students collaborate to: create a feasibility plan, a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, create a 3D model/simulation of their chosen asteroid, write code to select their asteroid among all documented asteroids.
Catch	Is asteroid mining feasible?
Activity	Pertaining to STEM (and RAMPED): students will use the SDSS Navigate Tool and Jupyter to chose their asteroid, will use Unity software to recreate their chosen asteroid in 3D.
Review	Pertaining to STEM (and RAMPED): throughout the 4-week problem students will work daily in the computer lab reviewing their work with tutors and, during the final two weeks, work with and teach 5th grade students how to create a 3D model/simulation
Assessments	<ul style="list-style-type: none"> ~ Formal presentation to authentic audience ~ Documentation of SWOT analysis ~ Placing 3D model/simulation on-line
Posttest Questions (same as pretest questions)	How can we select a specific asteroid to extract its resources for the betterment of mankind?
Standards	See page 3 below.
Crosscutting Concepts from NGSS	From NGSS/NSTA: 3. Scale, Proportion, and Quantity 4. Systems and System Models 5. Energy and Matter



Language Arts	Science	Social Studies	Technology
BOE: Functional Feasibility study Persuasive speaking Research, Prioritizing sources Listening skills Literature	How do scientists know what they know about the Solar System? Properties of elements Spectrometry Origin and formation of the solar system Laws of motion	Who owns outer space? Solar system geography Impact of raw materials mined in space on the global economy	How is animation used to better presentation? What animation programs are available online? Multi-perspective thinking

ASTEROID PROBLEM Standards 2016

Science

Concepts & Processes (1)

Structure and property of matter
Interactions of energy and matter

Science as Inquiry (2)

Students research scientific information and present findings through appropriate means

History and nature of science in personal and social decisions (3)

Scientific information and decision making

Language Arts

Reading (1)

Variety of sources
Understanding of informational resources

Writing (2)

Bibliography
Writing w/ audience in mind
Organization/focus

Speaking & Listening (3)

Formal presentation
Details to support ideas
Group discussion
 consider other's ideas before speaking
 constructive criticism
 lead, participate & moderate

Social Studies

Production, Distribution and Consumption (3)

How different economic systems are organized for production, distribution and consumption
Impact of global economic interdependence

People, Places and Environments (5)

Interpret charts, maps, graphs
Organize and process information about people, places and environments