

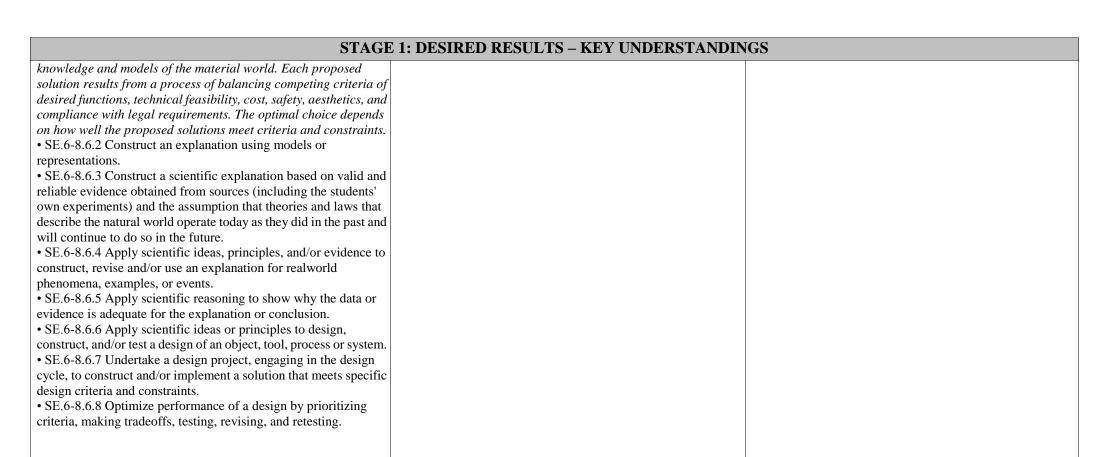
Brown Math Enrichment - Science Competition

Unit Focus

STAGE 1: DESIRED RESULTS - KEY UNDERSTANDINGS

Students will work collaboratively in groups of 2 - 4 students to submit a project to Exploravision. The groups are immersed in real world problem solving with a strong emphasis on STEM. Students are challenged to envision and communicate a new technology 20 years in the future through collaborative brainstorming and research of current science and technology.

STAGE I: DESIRED RESULTS - REY UNDERSTANDINGS		
ESTABLISHED GOALS	TRANSFER	
NGSS Science & Engineering Practices	T1 Make observations and ask questions to define a problem based on prior knowledge and curiosity that stimulates further	
NGSS Science & Engineering Practices: 6-8	exploration, analysis, and discovery.	
SE.6-8.1 Asking Questions and Defining Problems: A practice of		
science is to ask and refine questions that lead to descriptions and		
explanations of how the natural and designed world(s) works and	actions.	
which can be empirically tested. Engineering questions clarify problems to determine criteria for successful solutions and	T3 Make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution.	
identify constraints to solve problems about the designed world.	13 Wake sense of a problem, findate a plan, execute it, and evaluate the reasonableness of the solution.	
Both scientists and engineers also ask questions to clarify ideas.	T4 Evaluate the accuracy and efficiency of a given solution.	
• SE.6-8.1.4 Ask questions to clarify and/or refine a model, an	MEANING	
explanation, or an engineering problem.		
SE.6-8.3 Planning and Carrying Out Investigations: Scientists	UNDERSTANDINGS	ESSENTIAL QUESTIONS
and engineers plan and carry out investigations in the field or	U1 Established knowledge provides the foundation for future	Q1 What is the problem?
laboratory, working collaboratively as well as individually. Their	scientific and engineering advances.	
investigations are systematic and require clarifying what counts	U2 Cood amonimum toldering loods to make and accounts date	Q2 How can I break a problem down into manageable parts?
as data and identifying variables or parameters. Engineering	U2 Good experimental design leads to precise and accurate data.	Q3 What do I need to support my answer?
investigations identify the effectiveness, efficiency, and durability	U3 Conclusions can only be as strong as the quality of the	Q3 what do I need to support my answer:
of designs under different conditions.SE.6-8.3.1 Plan an investigation individually and	evidence and the relevancy to the original question or problem.	Q4 How can I use what I know in the world?
collaboratively, and in the design: identify independent and	ACQUISITION OF KNOWLEDGE AND SKILL	
dependent variables and controls, what tools are needed to do the		
gathering, how measurements will be recorded, and how many		SKILLS
data are needed to support a claim.	K1 Technology has an origin story	S1 Identify problems for which technology can play a role in
SE.6-8.6 Constructing Explanations and Designing Solutions:	V2 To do do so to do do so 'd' so do so d'	the solution
The end-products of science are explanations and the	K2 Technology can have both positive and negative	S2 Evaluate information on the internet
end-products of engineering are solutions. The goal of science is	consequences on people and the environment	S2 Evaluate information on the internet
the construction of theories that provide explanatory accounts of	K3 In order for technology to advance, breakthroughs in science	S3 Work collaboratively as integral members of a group to
the world. A theory becomes accepted when it has multiple lines of	and/or engineering must occur first.	develop a solution to a problem
empirical evidence and greater explanatory power of phenomena	und, of engineering must occur mist.	develop a solution to a problem
than previous theories. The goal of engineering design is to find a		S4 Construct a proper bibliography
systematic solution to problems that is based on scientific		r · r · · · · · · · · · · · · · · · · ·



Student Growth and Development 21st Century Capacities Matrix

- Critical Thinking
- Collaboration/Communication