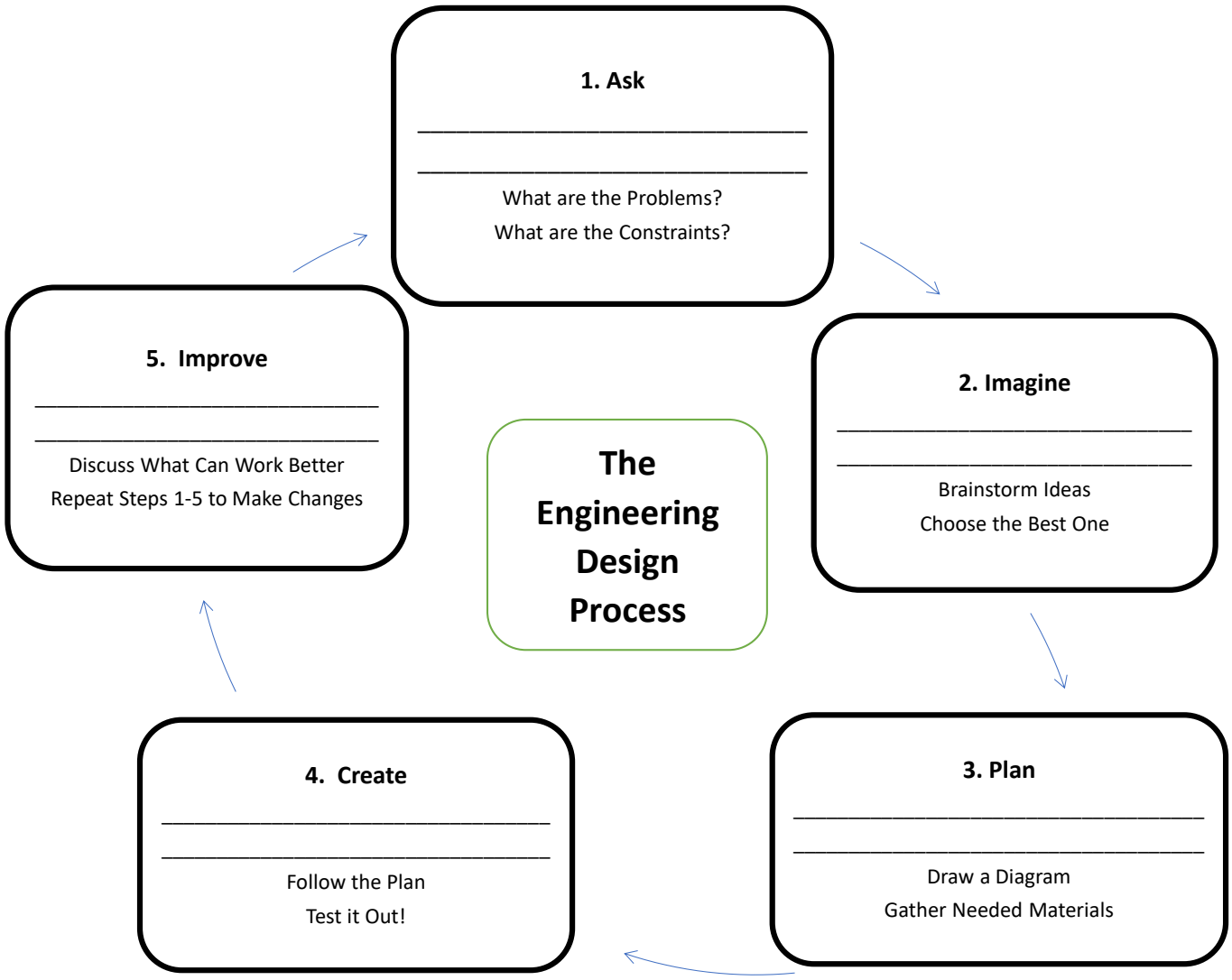
..Date:	STEAM Day 1	STEAM Day 2	STEAM Day 3	STEAM Day 4	STEAM Day 5
Learning Targets	Today I am... listen and discuss ideas about STEAM So that I can... understand why STEAM thinking and engagement is important In order to... build a solid foundation knowledge about STEAM	Today I am... going to go through some research and hands on work So that I can... compile my knowledge In order to... understand and demonstrate the Engineering Design Process	Today I am... going to review cause and effect So that I can... learn to write a proper hypothesis In order to... understand a part of the Science part of STEAM	Today I am... going to brainstorm about technology So that I can... create a list of different technologies I have access to/exist right now In order to... extrapolate ideas about what technologies we could create in the future	Today I am... use the EDP to create something that moves at least one meter in distance with air and has structure So that I can... demonstrate my understanding of the EDP In order to... see myself as an engineer
Opening:	What is STEAM? Why is it important? What questions do you have about STEAM?	Draw/Sketch quickly but neatly what an engineer looks like. Why did you draw what you did?	What is cause and effect? What are the key words in a hypothesis? Why do we create a hypothesis?	What is technology? Why is technology helpful? How is technology harmful?	What is the Engineering Design Process? What would happen if a piece of it was missing?
Lesson Plan (include strategies)	What is an Engineer? https://www.youtube.com/watch?v=owHF9iLyxic What is the Engineering Process? https://www.youtube.com/watch?v=fxJWin195kU Here is the Engineering Design Process Graphic Organizer to go with the process video. [See the bottom of this document for a	[Students will need 5 index cards, ruler, and 12 inches of tape – no redo on the tape] Review the Engineering Design Process with the class. Questions: How do I build a structure out of a certain material? How do I make it stand by itself? How do I make it as tall as possible and still be in the guideline? All these questions are similar to everyday questions actual engineers must contend with in their careers.	[As the teacher, you are going to need a ball to bounce or a piece of paper to crumple.] [Cause and Effect Worksheet, IF/THEN/BECAUSE worksheet are in the lesson plan file to be used.] Bounce the ball or crumple the paper and ask the students what happened. Ex. Because you dropped the ball it bounced. Ex. Because you wrapped your hand around the	Here are some articles from Newsela. For those of you who are not familiar with the site. You can go to the article and change the Lexile of the article. To make it easier or more challenging. What Will Humans Eat on Mars? https://newsela.com/read/lib-what-humans-will-eat-on-mars/id/2000000369/?collection_id=2000000192&search_id=3b3554ec-81dd-4e0f-a65c-7c4c722351e9	Post the EDP (Engineering Design Process) Write Up Sheet. [This is in the Lesson Plan file] Students will be given the problem stated above in the Learning Targets. DO NOT GIVE THEM THE ANSWER. Let them problem solve. [For your benefit, air can be several different things: them blowing on it, a balloon attached to it, them fanning it, etc.] Have them use the Engineering Design

Commented [AU1]: This is a link to a template of all three articles in one assignment. Scholars should login through Clever using their active directory.

	copy of the graphic organizer]	Have the students set out/have in a separate window on their device the graphic organizer for the Engineering Design Process. Their goal is to make a structure that stands on its own at the tallest height possible. Remind the students how to measure properly. Remind the students before they make changes to the structure, they need to make changes in their plan. They are to take a picture of final build. This way they can be shared with the class and discussed about what went wrong and what went right.	paper and squished it, it crumpled. Ask the students what the "technical" term is for this situation. Discuss: The definitions for cause and effect. CAUSE *verb* make (something, especially something bad) happen. *noun* a person or thing that gives rise to an action, phenomenon, or condition. EFFECT *noun* a change which is a result or consequence of an action or other cause. When we talk about cause and effect in Science, we sometimes refer to a hypothesis. The parts of a hypothesis are "If…then…because…" or "If…because…then…." Ex. If I drop the ball then it will bounce because the ball is made of a material that causes it to bounce. (It	Space Station Will Soon be Out of This World Vacation Spot https://newsela.com/read/visit-space-station/id/52838/?search_id=c779a68b-68d8-4e7a-9905-681ba3b95f15 For a young engineer, helping a disabled student kindles a new passion https://newsela.com/read/3d-print-hand-violin/id/22571?search_id=97b1482d-965d-47d9-90d4-452660cc1959 All three of these articles pertain to technology, science, and at least a third focus (food, space, the arts) if not more. You can hand all of them out, pick one to focus on, or break the students into groups and jigsaw them together. The key is to inspire them about the technology that is already out, the technology that is coming, and the	Work Sheet to show their plan. Make sure they are making a plan and not just building. Remind them of the information from Lesson 2 about having a plan and finances to build it. Remind them if they want to change something in their structure, then they need to explain what went wrong and draw a new plan before the rebuild their structure.

			can be more technical than this, but this is enough.) Ex. If I squish a piece of paper then it will crumple because I placed a force on the paper it could not withstand and therefore changed shaped. At this point have the students brainstorm some basic actions – brushing teeth, eating, showering, breaking a stick, for example. Then have them create a hypothesis to go with it.	technology that has not been thought of yet.	
Closing:	Let the students know they will be doing activities with each letter during this grading period. This will lead to a bigger project during 2nd grading period. It is important for them to feel comfortable with all the pieces that make up STEAM.	Recap on the importance of changing the plan before changing the structure. In the real world, engineers must have a plan. Then the financial people in the company must find funding for the project. If mistakes happen or resources are wasted it costs money. Therefore, the plan must be well thought out and followed so mistakes are not made, and projects can be completed within budget.	Review what cause and effect are by definition and real-life example. Review the three important words in a hypothesis. Answer any last-minute questions the students might have about the subject.	Recap the discussion you had as a class. Answer any questions the students still have about the lesson. • Students will need to round up supplies in their home that can be used to build something next time – paper, cardboard, tape, string, etc.	Recap with what went well and what are they still trying to problem solve. Answer any questions the students may have about the lesson.
Assessment:	Exit slip – What are you curious about now? (Click here for Forms Template of exit slip)	Exit Slip – What would you do differently if you had to build it again? What is your favorite part of the process and why?	Exit Slip – Give an example of cause and effect. What was your favorite hypothesis today?	Exit Slip – What was your favorite technology that exists and why?	Exit Slip – What was your favorite part of the process and why? What was your most difficult part and why?

	• Click duplicate • Update title • Share with class (link or embed)	(Click here for Forms Template of exit slip) • Click duplicate • Update title • Share with class (link or embed)	(Click here for Forms Template of exit slip) • Click duplicate • Update title • Share with class (link or embed)	What was your favorite technology that does not exist yet and why? (Click here for Forms Template of exit slip) • Click duplicate • Update title • Share with class (link or embed)	(Click here for Forms Template of exit slip) • Click duplicate • Update title • Share with class (link or embed)
Differentiation and Specialized instruction	Special Ed may want to fill in some of the blanks or at least start out some of the blanks to scaffold some of our special needs students.	The Write Up Sheet is well scaffold with questions/prompts to help students succeed. For advanced students you could suggest they do a Phase 3 or put a constraint on their building process they did not have before in the process.	The Cause and Effect worksheet is basic to help with understanding of the concept. For advanced students, challenge them to figure out which parts of the IF/THEN/BECAUSE statement are the independent and dependent variable.	Newsela has built in differentiation. Select lower and higher Lexiles to distribute to your students. It will be about the same content. Newsela adjusts the vocabulary and sentence structure for you. Plus, there are assignments you can give with each article if you want to reinforce content and comprehension.	Scaffolding: Work Sheets can be modified to steer students' thoughts and decision-making. Pictures may be included. Advanced: Make the distance longer, limit the types of supplies, and/or pick their air source.
STEAM connections	This is STEAM	This is STEAM	This is STEAM	This is STEAM	This is STEAM
Notes	We have left out the drama/theater part of the Arts Integration part due to confidence issues which could arise. Drama and theater are powerful pieces and certain students could perform these individually. However, our goal is to make all of them feel comfortable with this aspect of STEAM so we will hold off until they return.		Reach out to your Science Dept members if you need extra help.		


1. Ask
What are the Problems?
What are the Constraints?
2. Imagine
Brainstorm Ideas
Choose the Best One
3. Plan
Draw a Diagram
Gather Needed Materials
4. Create
Follow the Plan
Test it Out!
5. Improve
Discuss What Can Work Better
Repeat Steps 1-5 to Make Changes
The Engineering Design Process