

Keep this Sheet, so that your Teacher can check off items as you complete them.

Name: _____

Builder Fair Project

1. Due 10/6: My Area of Interest is: _____.

Checked by Teacher!

2. Due 10/9: My Guiding Question is:

Checked by Teacher!

3. Due 10/17: My research that helps me answer my guiding question is found on four notecards, which are stapled to this page.

Checked by Teacher!

4. Due 10/26: My project is integrated with:

(Circle one or more): Technology Art Math.

I implemented this by _____.

Checked by Teacher!

5. Due 10/26: I wrote five sentences explaining this integration on the half-sheet which is stapled to this page.

Checked by Teacher!

6. Due 11/16: I have completed the building of my project and have brought it to school. (I have included my integration, if applicable).

Checked by Teacher!

7. Due 11/17: I have given a two-to-four minute presentation to my science class, showing my project, discussing why I made it this way, and what I learned from this process. I have written presentation notes on notecards to help me.

Checked by Teacher!

8. Due 11/17: I have completed a ten-sentence reflection paper, discussing what I think I learned while researching, building, integrating, and showing my project.

Checked by Teacher!

9. Due 11/17: I am ready for my project to be graded by my teachers, according to the attached rubric.

Checked by Teacher!

Builder Fair Grading Rubric _____ /46 = _____ %

Name: _____

Creativity	<ul style="list-style-type: none"> +demonstrates curiosity +presents unique perspective to problem +distinctive final product <p>(all 3 = 6 pts)</p>	<ul style="list-style-type: none"> +demonstrates curiosity +presents unique perspective to problem +distinctive final product <p>(2 of 3 = 4,5 pts)</p>	<ul style="list-style-type: none"> +demonstrates curiosity +presents unique perspective to problem +distinctive final product <p>(1 of 3 = 2,3 pts)</p>	<ul style="list-style-type: none"> +little or no attempt made to demonstrate curiosity or present problem and product from unique perspective <p>(0,1 pts)</p>
Organization	<ul style="list-style-type: none"> +keeps all deadlines +independently plans for needs <p>(9, 10 pts)</p>	<ul style="list-style-type: none"> +keeps most deadlines +needs few reminders to plan for needs <p>(6, 7, 8 pts)</p>	<ul style="list-style-type: none"> +kept some deadlines +needed many reminders to plan for needs <p>(3, 4, 5 pts)</p>	<ul style="list-style-type: none"> +met few or no deadlines + no plans for needs <p>(0, 1, 2 pts)</p>
Productivity	<ul style="list-style-type: none"> +efficient use of time and resources <p>(9, 10 pts)</p>	<ul style="list-style-type: none"> +minimal teacher input or redirection needed to use time and resources wisely <p>(6, 7, 8 pts)</p>	<ul style="list-style-type: none"> +much teacher input and redirection needed to use time and resources wisely <p>(3, 4, 5 pts)</p>	<ul style="list-style-type: none"> +little or no productivity even with teacher support <p>(0, 1, 2 pts)</p>
Grit & Hustle	<ul style="list-style-type: none"> +shows ability to overcome obstacles and distractions <p>(10 pts)</p>	<ul style="list-style-type: none"> +minimal distractions and few excuses noted during project <p>(7, 8, 9 pts)</p>	<ul style="list-style-type: none"> +inhibited by many distractions and/or excuses during project <p>(4, 5, 6 pts)</p>	<ul style="list-style-type: none"> +distractions/excuses precluded completion of project <p>(0, 1, 2, 3 pts)</p>
Oral Presentation	<ul style="list-style-type: none"> +2-4 minute speech +explains area of interest, question, STEAM integration +good use of notecards <p>(5 pts)</p>	<ul style="list-style-type: none"> +speech over 4 min +explains area of interest, question, STEAM integration +poor quality notecards <p>(4 pts)</p>	<ul style="list-style-type: none"> +speech under 2 min +omits area of interest, question, STEAM integration +poor quality notecards <p>(3, 2 pts)</p>	<ul style="list-style-type: none"> +speech under 2 min +omits area of interest, question, STEAM integration +no notecards <p>(1, 0 pts)</p>
Reflection Paper	<ul style="list-style-type: none"> +explains area of interest, question, STEAM integration +explains new learning, personal accomplishment or connection <p>(5 pts)</p>	<ul style="list-style-type: none"> +omits one area of interest, question, or STEAM integration +explains new learning, personal accomplishment or connection <p>(4 pts)</p>	<ul style="list-style-type: none"> +omits area of interest, question, & STEAM integration +omits new learning, personal accomplishment or connection <p>(3, 2 pts)</p>	<ul style="list-style-type: none"> +very incomplete paper or no paper at all submitted <p>(1, 0 pts)</p>

Rationale:

- This year, our Builder Fair will replace Zion's Science Fair. Our hope is that this change in focus will be a great learning experience for our kids: That they'll use their own creativity as the driving factor in their learning. The Builder Fair will be aligned to the STEAM components, which means that we'll be integrating Science, Technology, Engineering, Arts, and Math into these projects.
- Our Middle School Staff felt the need to better prepare our students for what they will see in high school. High School Science classes are shifting to focus on STEAM, because these curricula are engaging for students and are useful for equipping kids for careers in related fields.
- We want to encourage students to be creative, to explore, to discover, and to learn. We want them to be prepared for the next step in their education, and we want them to take responsibility for their own education, while providing support as often as necessary. We feel that our plan for this year's Builder Fair will accomplish all of this.



Science | Technology | Engineering | Arts | Mathematics

EDUCATION ^{©TM}₂₀₁₄

Here's Help with Area of Interest!

What Area of Engineering or type of building project could my child use for the builder's fair?

Consider the following ideas and resources:

Gears	Machines	3-D geometric shapes	Circuit Boards
Bridges	Robots	Roller coasters	Zip lines
Skyscrapers	Airplanes	Marble runs	Rube Goldberg Machines
Movable Toys	Pulleys and Levers	Boats	Whirligigs
Movable Sculptures	Helicopters	Rockets	Catapults
Landscape designs	Cars	Hovercrafts	Wheels

*Remember you need to ask a question to focus the purpose of the project

ex: What is the longest, strongest, fastest _____ I can build using _____?

How does length affect weight supported by my popsicle bridge?

How does height impact sway of my lego tower?

Does my machine spin faster with gears the same size or different sizes?

Online Resources:

<https://www.pinterest.com/pin/164170348892154844/?lp=true>

<http://www.instructables.com/id/Project-Based-Engineering-for-Kids/>

<https://thehomeschoolscientist.com/100-engineering-projects-kids/>

<https://www.pinterest.com/kcedventures/kids-engineering-projects/>

Here's Help with your Guiding Question:

Your guiding questions sets criteria for your project. It gives you a purpose and a goal. A guiding question should be specific, and should have a definite answer that you don't already know.

First, here are some examples of poor guiding questions. They're called "inch-deep" questions because they are too simple:

Can I build a bridge with popsicle sticks?

Can I build a paper airplane?

How many colors can I use in a landscape design?



Here are some "mile-deep" guiding questions. These would be great for your project:

How many pounds of weight can I support with a popsicle-stick bridge?

How can I design a paper airplane that would fly over 30 feet?

What scale would be appropriate for an outdoor garden with cedar trees and tulips?



Here is a checklist to help you refine your question. You will not be able to check off all the times, but the more the merrier!

- **The question is appealing to you.**
- **The question is concise.**
- **The question has no easy answer.**
- **The question taps into your interests and passions.**
- **The question does not sound like a test question.**
- **The question leads to more questions.**
- **There is more than one answer to the question.**
- **The topic is personal and local.**
- **You can relate this to your daily life.**
- **There is an audience for your project.**
- **The question requires serious investigation.**
- **You will learn important skills and content.**
- **Your project will make a difference in the world.**

Vincent, Tony, "Crafting Questions that Drive Projects." 10 October 2014, 3 October 2017. LearninginHand.com.

Here's Help with Research, Citations, Sources & Notecards!

As you research your project for the Builder Fair, make sure to record information from your sources to properly cite your information. You'll copy your information on to notecards—with one notecard per source. Your notecard will include a citation, and all the information you want to remember for your project. When you cite your sources, you must provide as much information as possible.

- Many times with Internet sources, especially on an online database, there is no AUTHOR NAME. When this occurs, you simply start with the next piece of available information, which should be the TITLE OF THE ARTICLE
- Another piece of information that is difficult to find is the DATE LAST UPDATED this is usually found at the bottom of the webpage and will either be in the form of a copyright date or will say "last updated on:".
- The DATE LAST UPDATED and the DATE OF ACCESS should be formatted in the following way NUMBER DAY ABBREVIATED MONTH YEAR (Example: 19 Apr. 2010)
- Make sure that when you cite your source, the information appears just as it is shown in the example provided below. The first line of the citation should be left-aligned and the second line should be indented once.
- For the URL, include the entire web address by handwriting it. Use the carat marks < and > at the ends of the URL and end with a period.

Rockets are not the same as turbojets, because in a rocket 100% of the gas is used as a propellant. Rockets use Newton's Law of Motion—action/reaction

Information that I want to use and remember

"Rocket." *Encyclopedia Britannica Online*, 2017, 3 October 2017.

Citation; Source of this information

<<https://www.britannica.com/topic/rocket-jet-propulsion-device-and-vehicle>>.

Here's Help with Technology / Art / Math Integration!

Every project must include Science and Engineering as the backbone of the product. In addition, we are challenging students to incorporate components of Technology, Math and Art into the design of their work. By doing so, students will have opportunities to develop “big picture” concepts of design. These integration techniques may be as simple as explaining the choice of color scheme or as complicated as developing equations that explain why something works the way it does.

Here are some ideas of how to incorporate these components into your build:

<u>Technology</u>	<u>Art</u>	<u>Math</u>
create a PowerPoint	define color scheme	use scale / ratios
make an iMovie	incorporate elements of design	include a data table or graph
use specialized tools	compare / contrast model with existing works of art/ architecture	measure: height, weight, length, density, angles, area, perimeter, volume
create computer graphics	use different media: wood, clay, metal, etc.	use equations or functions to solve problems

Here's help with Building your Project!

- You're going to build your project at home. Your materials, in theory, should be everyday household items like popsicle sticks, straws, legos, balsa wood, clay, aluminum foil, or toy construction sets.
- You should have a design before you begin, rather than making up your project as you go.
- You should keep your Guiding Question in mind as you are building your project. It determines the reason that you're building.

Here's help with your Oral Presentation!

- You're giving a short speech to your Science Class on the day of the Builder Fair. You may use notecards during your speech, and you should show your project at this time. The focus of your speech should be "Here's what I built, and here's what I learned by building it."
- You may use all the notecards you'd like as you give your speech. You should write the notecards ahead of time, you should practice your speech a couple of times, and you should time it, so that it's between 2 and 4 minutes long.
- Your notecards can have anything you'd like written on them, but the best strategy may be to create notecards for each main point you want to talk about, and then just jot a few key words for each main point. Each notecard might have 5 or 6 words on it, but you'll be able to talk about for 40 or 50 words.
- Remember, as you're giving your presentation, you're talking to your best friends. We are all going to be good listeners, and supportive of you. Don't worry, just tell us what you made, and what you learned.
- The oral presentations will be given during Science Class on the day of the Builder Fair.

Here's help with your Reflection Paper!

In Science Class, on the day after the Builder Fair, you'll be asked to reflect on your project. You'll be asked to write a ten-sentence reflection paper. Similar to the Oral Presentation, your focus should be on what you built, and what you learned from this experience. Your Science Teacher will be able to answer specific questions during class, and will help guide you through the process of writing this reflection paper.

