

STEAM Subject: Engineering

Lab: The Best Blueprints Grades: 4-8

Learning objective:

Students will be able to design a blueprint of a building, a section of a building, or an object they want to construct.

ENGAGE:

Ask students the following questions:

- What are blueprints and what are they used for?
- With modern technology, is it efficient to design a blueprint by hand or on a computer?
- What are the implications of using blueprints for a new construction project?

EXPLORE:

Making the Best Blueprints Activity

Students will design their own blueprints!

Materials needed per student:

- One blank sheet of paper (may require more depending on the student's design)
- A pencil with an eraser
- A ruler or straight edge of some sort (such as a piece of cardboard, a school ID, etc.)
- Optional: Graph paper to use as a scaling tool

Directions:

Students will choose what they want to make as a blueprint, a building, a section



of a building, an imaginary building - the possibilities are endless. Encourage them by sharing ideas of potential blueprints, such as their own house or bedroom, a store they've been to, or a castle they wish existed. They could even draw EIS or their school! Have them label each room/area and encourage them to draw large furniture in the rooms, such as a bathtub and toilet in the bathroom, a table and chairs in the dining room, or a bed and dresser in the bedroom. If drawing something with multiple floors, have students use multiple sheets of paper. Students who need visuals to assist them on their blueprints can look at the examples below.







2 BEDROOM & 1 BATH 529 SQ. FT.

Image credit: http://www.utsa.edu/housing/communities/#laurel



EXPLAIN:

Students will review their blueprint design.

Compare and contrast your blueprint to any of the blueprint examples above. What are the differences and similarities? These questions should be answered based on the work that was completed.

Watch this video about blueprints: <u>https://www.youtube.com/watch?v=DkJLbCCI6Zs</u>

Connection and optional activity: Think of video games where you can create buildings, such as Minecraft, Animal Crossing, The Sims, or Rollercoaster Tycoon. Do blueprints come in handy when playing these games? You have to conceptually visualize the space inside and out when creating buildings, similarly to an engineer. Try recreating your hand-drawn blueprints in your favorite video games. Does it look similar? Remember to add details, such as doorways, furniture, closets, and more! Check out an example of this optional activity:

https://education.minecraft.net/lessons/making-homes-part-1/

Review STEAM Vocabulary:

• Blueprint: A physical or electronic drawing of a structure.



- **Design**: A plan for the construction of an object.
- **Scale:** The ratio of measurements. For example, 1 inch on a blueprint would be 1 meter in real life. If you used graph paper for your blueprint, 1 square could represent 1 foot in real life.

EVALUATE:

- Have students think about how engineers utilize blueprints in real life.
- Will one simple drawing of a structure suffice? Or will they need multiple drafts?
- What else do engineers have to keep in mind as they map out their blueprints?
- Is it convenient to have a blueprint the size of the actual building? Why or why not?
- Is it easier to draw a blueprint by hand or use a computer to design a building?



Elementary Institute of Science – <u>eisca.org</u> – <u>info@eisca.org</u>