



Livestock-Maker: Build-a-BarnBa

Purpose:

- To explore Science, Technology, Engineering and Math (STEM) skills through animal science
- Let youth use their STEM creativity to solve real world animal science problems

Scenario:

Robots and computer systems are commonly used on farms. Robots are being used to milk dairy cows. Computers are being used in automatic feeding systems, heat and ventilation systems, and in tractors. Technology innovations are constantly improving efficiency, and the agriculture industry is at the forefront of this innovation generation.

Problem:

As a busy teen-ager with sports, 4-H activities and friends, you are falling behind in your chores. You understand how important clean living spaces are for your animals, but need to find a quicker, more efficient way to get that done. As you are watching your mother's Roomba vacuum the living room one day, you think how cool it would be to take the Roomba out to the barn and clean up after your animal. So, you decide to design a BarnBa. Below are questions to consider:

- What size of the machine do you need?
- What type of animal do you have?
- What space does your barn have?
- How many pens/stalls does the barn have?

Supplies:

- 3 Hexbugs <https://www.amazon.com/d/Robotics-Kit/Innovation-First-Labs-Inc-477-2409/B002R7IK74>
- 1 Lego Technic Kit 42032 https://www.amazon.com/LEGO-Technic-Compact-Tracked-Loader/dp/B00NHQHP3E/ref=sr_1_24?s=toys-and-games&ie=UTF8&qid=1512069965&sr=1-24&keywords=technic+lego+sets

Expected Time: 60-90 minutes

What to Do:

1. Split into groups of 3-4 and choose an animal, barn type, and a measurement scale (ex: 1 inch = 1 foot). Spend a few minutes discussing what space you will need to think about when designing a BarnBa.
2. Take 25-30 minutes to use the provided supplies to build your BarnBa. Think creatively on your design! Make sure to think about the space needed for your animal, the make-up of your barn, and other details that will make having a BarnBa a good choice for your family.
3. Share about your group's BarnBa.

Reflect:

1. What animal did you choose?
2. How much waste needs to be cleaned away?
3. Is your design big enough to handle that waste?
4. What challenges did your group face?

Apply:

1. What did you learn through this activity?
2. How can prototyping a design help solve problems?
3. Why is it important to make work on a farm easier?
4. Would you rather design a robot or use a shovel to clean?