

These activities and questions have been designed for you to have engaging discussions with your student about the STEM jobs they are encountering in their Learning Blade schoolwork. Here is an overview of what is included.



Table Talk: These are questions you can ask your student without having any background knowledge in STEM. These will be easy conversation starters.



Dig Deeper: These are questions with suggested links to learn more about different STEM careers to explore with your student.



Home Lab: This is an easy, hands-on activity to do with your STEM student.

What Has Your Student Been Learning?

In this mission, your student's goal is to design the car of the future, and help to determine what that looks like. Not only does their car need to look good, but it has to be safe and environmentally sensitive. Along the journey students will need to determine what tools (i.e. **automation mechatronics, innovative materials, test track, assembly line, and paint**) and teammates/experts (i.e. **automotive designer, welder, manufacturing technician, safety administrator, and mechanical drafter**) are needed to assist in finding out more about car designs and how to make cars safe and environmentally sound. It is up to the student to determine what help is required based on the clues provided to design a next-generation car.

TABLE TALK

Starter Question:

What is your dream car and why? Is it self-driving?

What are the challenges of designing the software for a self-driving car?

Helpful Hint:

Self-driving cars need to do everything a human does. What aspects of driving would be hardest for a self-driving car?

Can you think of some situations near your home where it may be difficult for a self-driving car to proceed safely? Would it involve moving things, like people or bikes? Would it involve other objects, like signs, fences, or construction areas?



DIG DEEPER

Resources for More Information:

In this section we provide a series of links and associated questions to DIG DEEPER on individual careers addressed in the Manufacturing a Concept Car Mission. Feel free to explore these with your STEM student as you model curiosity and lifelong learning.

Have you heard talk about self-driving cars? What are some pros and cons of cars that can drive themselves? Create a list and discuss how a self-driving car would impact your community, cities, and family. How do you think Automation Mechatronics play a role in self-driving cars? Learn more about self-driving cars and the technology behind them at the link below.

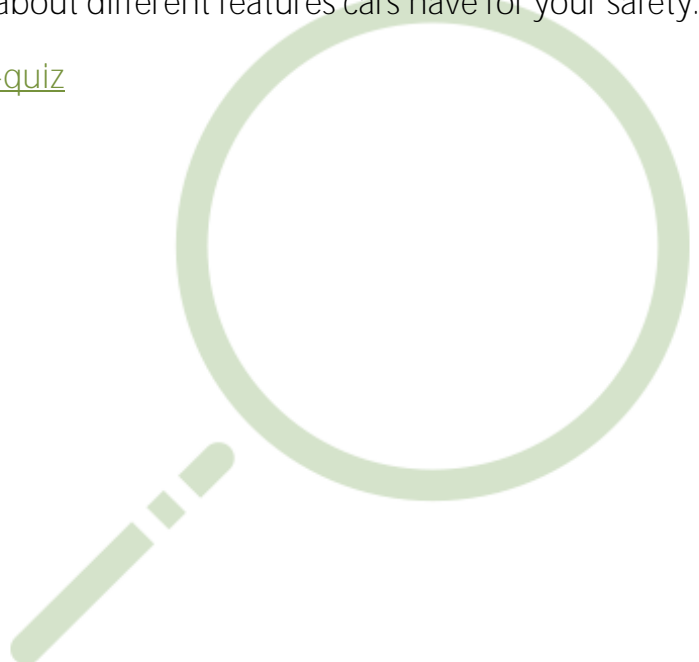
<https://waymo.com/tech/>

Think of an item you have seen or used that needed a Welder to help create it. What are some other objects you have seen that rely on welding? There are many career options in welding. Follow the link below to learn 10 facts about welding.

<http://www.gowelding.org/articles/facts-about-career-welding/>

Manufacturing a car starts with an idea, that is turned into a prototype, and finally mass produced for the customers. This process takes a lot of testing and revisions. Think of different ways a Safety Administrators test cars to make sure they are safe for customers to drive. How would you test cars for safety? Take the quiz at the link below to learn about different features cars have for your safety.

<http://quizzes.howstuffworks.com/quiz/car-safety-quiz>



In this lab we will be building a small car powered by air escaping from a balloon. First, imagine how you would want your own balloon-powered car to look. Can you design a car that will travel as far as possible? You can even measure your car's speed using your smartphone and Google's Science Journal app.

Materials

- CDs (4)
- Latex balloons
- Straws
- Wooden pencil
- Sheets of paper
- Paper clips
- Tape
- Scissors
- Glue
- Any other materials you want to use.



Designing The Car

1. Think about what materials you can use for your car. Think about how these pieces will work and how they will connect to each other.
2. Sketch out your car and label what materials will be which part of your car. Keep in mind you want your car to go as fast as possible.
3. Start building! Get creative with what you think will work best and what materials you choose to use. Remember you need to attach the balloon to the car somehow and be able to inflate it. Hint: Use bendy straws and a rubber band to attach it and be able to blow it up.
4. Inflate a balloon, pinch the end to keep the air from escaping, and attach to car.
5. Place car on the floor and watch!

Did your car move? Did it go straight? What could you do to improve your cars speed?

What data can you gather to assess if your efforts to redesign or improve your car are working?



#STEM4Parents Manufacturing a Concept Car

Dear Parent/Guardian,

I kindly ask that you fill out and sign this piece of paper so I can provide your student with a completed grade for this #STEM4Parents homework assignment.

I discussed with _____ the Manufacturing a Car Mission in Learning Blade.
(student name)

Student Signature



Parent/Guardian Name (print)

Date

Parent/Guardian Signature

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