



NM MESA Virtual STEM Series Lesson Plans

Virtual STEM Series – a world of STEM at your fingertips!

NM MESA's Digital Learning Page (<https://www.nmmesa.org/resources/digital-learning/>) features a compelling array of STEM professionals from across New Mexico and the country. These videos give students and teachers a rare inside look at different STEM fields and the STEM professionals that work within them.

The NM MESA Virtual STEM Series also provides opportunities to gain a deeper understanding of what it takes to become a STEM professional. In fact, many may be surprised to know that the foundational skills required in virtually every STEM job doesn't necessarily include mastery of mathematics or science concepts. Rather, STEM jobs require critical thinking, problem-solving, and the ability to adapt. And many STEM professionals say that their current career wasn't what they envisioned when they were in high school or college, and many times they didn't even know that their job existed until someone else showed them. These are some of the most important lessons students can learn as they engage with the STEM Series.

The NM MESA Virtual STEM Series Lesson Plans are designed to help students understand STEM career pathways, STEM skills, and reflect on their own possible pathways as they take part in the STEM Series videos and associated materials. There are three lessons:

- (1) **Lesson 1: Many Paths Lead To STEM** – students are challenged to document the skills and experiences depicted in each of the STEM Series.
- (2) **Lesson 2: What Career is Right for You?** We recommend that students complete this Lesson at the beginning of STEM Series, and then again after they have engaged with the STEM Series to see if their responses have changed.
- (3) **Lesson 3: STEM Investigation and Design Challenge** - Students are challenged to follow the engineering design process to create or improve upon a piece of equipment that the STEM professional could use to help her/him be more effective. This Lesson can be completed following any of the STEM Series



NM MESA Virtual STEM Series – Lesson 1

MANY PATHS LEAD TO STEM

Did you know that STEM jobs make up the fastest growing career field in New Mexico? There are lots of jobs and careers in science, technology, engineering, math, and healthcare – and they pay more than non-STEM jobs! Even if you don't think you're interested in a typical STEM job, 20% of all U.S. jobs will require you to be competent in at least some aspects of STEM. Think of all the items that you use each day that require technology--smart phones, computers, cash registers, the systems controlling traffic lights and the water you use, and even many people's front doorbells!

The path to getting a job in STEM may surprise you. While, some STEM jobs do require higher education and years of school, others require an Associate's degree or an Apprenticeship. Watch these videos to get an idea of the many paths that can lead to a career in STEM.

Virtual STEM Series – what will you be watching?

Topic/Name_____

BEFORE YOU WATCH & ENGAGE WITH THIS TOPIC, ANSWER THE FOLLOWING:

What do you think someone in this profession does on a typical day?

What kinds of skills do you think would be needed to do well at this job?

What type of school, classes, or other experiences do you think it would take to become this type of STEM professional?



NM MESA Virtual STEM Series – Lesson 1, con't

AFTER YOU WATCH & ENGAGE WITH THIS TOPIC:

Using the video as a reference, fill in the chart below, listing any experiences or actions that helped the STEM professional get to her or his current career. Were there experiences that held her/him back? Include those, as well.

Childhood Experiences	Teen Experiences	Young Adult Experiences	Adult Experiences	Current Career



NM MESA Virtual STEM Series – Lesson 1, con't

AFTER YOU WATCH & ENGAGE WITH THIS TOPIC:

What did you learn about what someone in this profession does?

What kinds of skills are needed to do well at this job?

What other types of jobs might also require these types of skills? Do a web search, citing your sources.

What other questions do you have about this profession?

MANY PEOPLE BELONG IN STEM

Some people excel in problem-solving skills or a deep knowledge of a subject. Some desire to help others. Some love to be challenged and are detail-oriented, enjoying taking an idea from concept to completion. Some people like a hands-on approach and enjoy taking things apart and figuring out how they work. Some are innovators, solving problems and coming up with new ideas. There's room for all of us in STEM!



NM MESA Virtual STEM Series – Lesson 2

What Career is Right for You?

Many STEM professionals say that their careers weren't on their radar in high school or college, and many times they didn't even know those jobs existed until someone else showed them. There are a lot of exciting STEM careers out there, and it is impossible to know them all! Try these activities to explore different careers that may be right for you.

Personal Career Exploration: Take both of these online STEM aptitude tests, then answer the questions below.

<https://stemstudy.com/stem-program-quiz/> - An exploration of college majors

<https://www.tryinteract.com/quiz/stem-potential-career-fit/> - An exploration of potential careers

What college majors and careers did these tests suggest for you?

Might these be a good fit for you? Why or why not?

How do your current hobbies, after school activities, and classes support your career path?

What else would you like to know about those courses of study or careers?

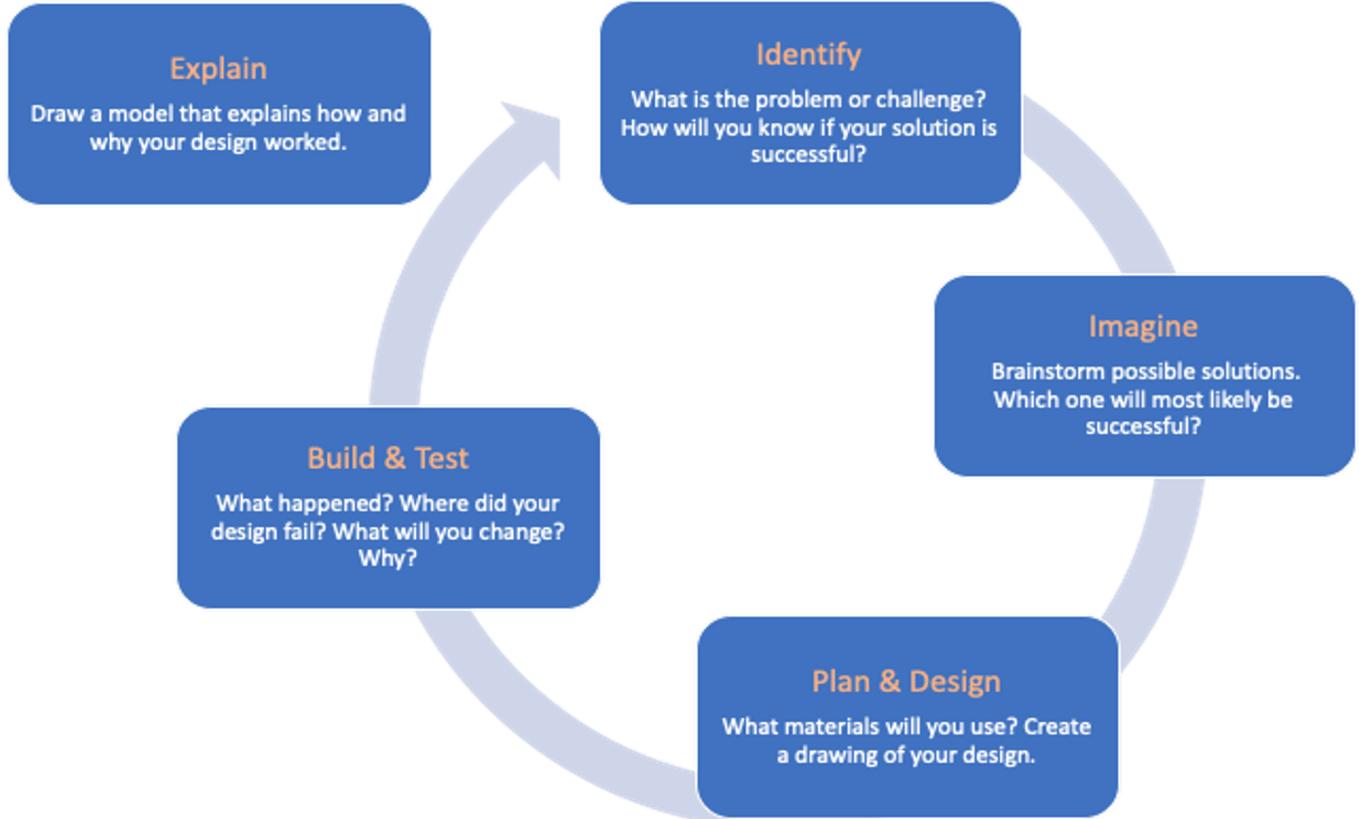
This exercise is not designed to suggest that there is only one path for you. Rather, it is meant to highlight possibilities of which you may never have thought! Keep in mind that your career choices will likely change and evolve over the course of your life, and you never need to settle!



NM MESA Virtual STEM Series – Lesson 3

STEM Investigation and Design Challenge

As you watch each video, you'll notice that STEM professionals use different STEM knowledge and rely on different tools, equipment, and gear to do their jobs. Each of these pieces of gear were created through the Engineering Design Process.



Becoming an engineer. Engineers use the principles of science and math to solve problems. As humans, it is in our nature to be problem-solvers – we all have the minds of engineers! Engineers often follow a series of logical steps, called the Engineering Design Process, to develop and test possible solutions to the problems at hand. The Engineering Design Process allows engineers to learn from their failures and arrive at great solutions.



NM MESA Virtual STEM Series – Lesson 3, con't

Your Challenge: Investigate STEM concepts and create or improve upon a piece of equipment that the STEM professional could use to help her/him be more effective.

To get started, answer these questions:

What are (at least) three new STEM terms/concepts you learned in the video?

What do you think these concepts refer to, and why are they important to the topic in this video?

List some of the tasks the STEM professional in your video did (for example, capture snakes). If they don't do any tasks, what are some of the tasks/skills they talked about or you would think are important for this topic?

What are some of the tools the STEM professional used to help her/him? What are some tools that you think would be helpful?



NM MESA Virtual STEM Series – Lesson 3, con't

Now you are ready to create or improve upon a piece of equipment! Follow the Engineering Design Process above, thinking of a piece of equipment or gear that will help the STEM professional in the video. Imagine a new product – what is the need for this new product? What are some properties of these materials that will ensure its success? Is there a product that already exists that can be improved upon? Try to find examples, citing your sources. How will you improve it?

Product Idea and Description	Pros – how will it help?	Cons – what are some disadvantages? Where might it fail?	Citation (where did you find information?)



NM MESA Virtual STEM Series – Lesson 3, con't

EXAMPLE: A marine biologist studies sawtooth sharks in their natural habitat. You notice that the biologist uses a normal wetsuit for their field research, so you design a wetsuit that behaves like chainmail to provide better protection. However, if the suit is too heavy, the biologist will sink. Therefore, you design a suit that is lightweight, waterproof, and flexible so the researcher can perform her/his normal tasks underwater with better protection.

Draw your design here – describe two key features of your design that make your product different and/or improved. (Any type of sketch is great!)

What are some of the constraints to your design? For example, will it be expensive, delicate, take a long time to manufacture, can only be made for one person, etc.?