

Science and Technology

Science and Technology Engineering and Mathematics Enrichment Program

Are you ready to teach STEM? I bet your asking yourself a lot of questions at this point. Let's ask the basics.

What is STEM? Stem is Science, Technology, Engineering and Math.

What is Science? Science is a systematically organized body of knowledge on a subject.

What is Technology? the application of scientific knowledge for practical purposes, especially in industry.

What is Engineering? the branch of science and technology concerned with the design, building, and use of engines, machines, and structures.

What is Math? Mathematics includes the study of such topics as quantity, structure, space, and change.

Why STEM ? You may ask yourself why STEM? How does this benefit our students here at YPW? Well in our new age of Technology and a society and economy moving in the way of technology base industries creating a demand in proficient workers in Science, Technology, Engineering and Mathematics. Studies have shown that for our children to succeed we need to expose them to STEM during early childhood. It is critical to establishing an optimal educational trajectory.

You may ask yourself How will I teach STEM ?

The reality of Today in our Early Preschool Centers most teachers are already implementing and teaching STEM practices in their classrooms and they don't even know it. We can teach STEM concepts by rotating a variety of centers such as patterns, shapes, block play and more. Most of us Teachers have taught the concepts of Sink and float, properties of liquid and solids, lever and pulleys, force motion and many others. We can teach children a wide range of these concepts on a daily, but have you ever noticed children enjoy two learning areas that can work STEM concepts without even knowing it. Block center and dramatic play area. By using these two areas we can give the children the opportunity to use man made material, natural material and scientific tools to build structures for the practice and process of science. Here at YPW we offer Lego Tech Machines and Lego Jr. Robotics. Both offer children a plot line with a wide variety of question to solve. In both Lego Tech Machines and Lego Jr. Robotics we offer children the ability to use the 4 C's.

What are the 4 C's you may ask?

- 1.Connect: Connecting the story to the question.**
- 2. Construct: to construct a structure to solve the problem/to make a solution**
- 3. Contemplate: Contemplate to think about it**
- 4. Continue: to continue with what they have learned and find other ways to solve**

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Not only does it offer the ability of using the 4 C's, but it also allows the children to use various developmental and key areas such as Language Development, Social and Emotional Development, Art, Science and Technology, Mathematics, Physical Development, and the knowledge and understanding of the World.

What should you know to teach the Lego Tech Machine or the Lego Jr. Robotics Enrichment program?

Before you need to know what, is in the Binders Info, which materials do we have? We should also know how to build and know what story prompt card idea will be used. Planning is very important. Which children will learn what? Is it age and developmentally appropriate?

Let's get ready. Planning.

- Plan Story Prompt cards, Legos, tools and class ready for students prior to their visit.
- Get to know the children
- Work on basic building, then adapt a little more after each visit.
- Teach children about material before using
- Allow students to explore
- Have one structure as visual and provide the instruction card if possible.

Allowing children to explore may get a little hectic since children may get upset if they can't get the material to work. Thus, allowing you to ask your students when things don't work, what else can you try to make it work? Teaching children mistakes and failures are normal parts of learning and growing. Science is knowledge that is learned by testable explanations and predictions/hypothesis so making mistakes is a must that's how we learn.

In both Lego Tech Machines and Lego Jr. Robotics you have prompt cards.

- The prompt cards either offer a story or knowledge about tools we use daily.
- They offer ideas and material we can use to build our own
- Ask children question on what to do.
- Find ways the students can build it with Legos or other material.
- Also asked what the structure can be used for / or any other scientific questions.

After the children have solved the solution of the Prompt card you can always add on to the students learning. Especially in large groups you can provide a wide range of material to make their own with manmade or natural material. This can be from building 3d figures made from marshmallows and tooth picks, observing natural material, making goo, exploring force motion energy with cars and toilet tubes, Sensory exploration filling, scooping and pouring. From making a

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pin wheel, and a balance, or paper air plane. Reading a book to go with the theme, showing images of what they will make as models, providing them with a wide range of vocabulary in a full Spanish immersion.

Some things they will learn about ...

- the lever
- Wheels and axles
- Pulleys
- Gears/Direction
- Gears/Speed
- Gears /Crowns
- Gears/Worms

1. Building vehicles such as helicopter, digger, truck
2. Build a flyer and a chopper
3. Build a bridge and a tunnel
4. And various others.

Let the games begin let's have fun building and using those 4 C's with our STEM Enrichment program in our Lego Tech Machine and Lego Jr. Robotics.

VIDEOS TO SHOW IN TRAINING: STEM CONCEPTS

<https://www.youtube.com/watch?v=HglYz0h2n2E>
<https://www.youtube.com/watch?v=p-B3GjmAbyY>
<https://www.youtube.com/watch?v=oZBdhk3jZdQ>

lego tech machines

<https://www.youtube.com/watch?v= YZbOhfGXis>

simple machines

<https://www.youtube.com/watch?v=aUE0opMT6Aw>