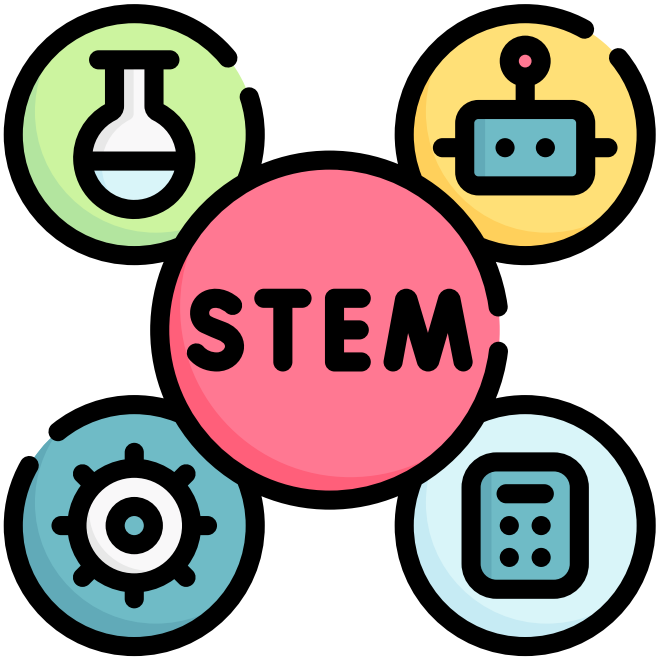
ScienceWorks
HANDS-ON MUSEUM

STEM Challenge Stations / Mission: POSSIBLE!

NOTE: These two workshops are similar, Mission:POSSIBLE! includes more challenge stations and is the outreach version of the same workshop. Individual challenge stations will vary.



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STEM Challenge Stations Pre K-2 Workshop

In this engaging workshop, students will rotate through up to 5-10 different engineering challenges each encouraging critical thinking, teamwork, and of course fun!

Activity includes:

1. **Engineering Design Cycle:** Students learn about and participate in the engineering design cycle, including planning their design prior to building.
2. **Building with Various Materials:** Students will build models and test solutions with various materials including paper, LEGOs, and others.
3. **Testing and Iterating the Design:** Students will test their model builds, and rebuild as needed based on the test results.
4. **Additional Challenges:** For advanced students, they will be given additional challenges for their builds.

Supporting NGSS & Common Core Standards:

K-2-ETS1-1 Engineering Design
Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
K-2-ETS1-2 Engineering Design
Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
K-2-ETS1-3 Engineering Design
Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
CCSS.ELA-LITERACY.SL.K.6
Speak audibly and express thoughts, feelings, and ideas clearly.
CCSS.MATH.CONTENT.K.CC.A.1
Count to 100 by ones and by tens.

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STEM Challenge Stations 3-5 Workshop

In this engaging workshop, students will rotate through up to 5-10 different engineering challenges each encouraging critical thinking, teamwork, and of course fun!

Activity includes:

1. **Engineering Design Cycle:** Students learn about and participate in the engineering design cycle, including planning their design prior to building.
2. **Building with Various Materials:** Students will build models and test solutions with various materials including paper, LEGOs, and others.
3. **Testing and Iterating the Design:** Students will test their model builds, and rebuild as needed based on the test results.
4. **Additional Challenges:** For advanced students, they will be given additional challenges for their builds.

Supporting NGSS Standards:

3-5-ETS1-1 Engineering Design
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2 Engineering Design
Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3 Engineering Design
Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

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STEM Challenge Stations 6-8 Workshop

In this engaging workshop, students will rotate through up to 5-10 different engineering challenges each encouraging critical thinking, teamwork, and of course fun!

Activity includes:

1. **Engineering Design Cycle:** Students learn about and participate in the engineering design cycle, including planning their design prior to building.
2. **Building with Various Materials:** Students will build models and test solutions with various materials including paper, LEGOs, and others.
3. **Testing and Iterating the Design:** Students will test their model builds, and rebuild as needed based on the test results.
4. **Additional Challenges:** For advanced students, they will be given additional challenges for their builds.

Supporting NGSS & Common Core Standards:

MS-ETS1-1 Engineering Design
Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2 Engineering Design
Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3 Engineering Design
Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4 Engineering Design
Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

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STEM Challenge Stations 9-12 Workshop

In this engaging workshop, students will rotate through up to 5-10 different engineering challenges each encouraging critical thinking, teamwork, and of course fun!

Activity includes:

1. **Engineering Design Cycle:** Students learn about and participate in the engineering design cycle, including planning their design prior to building.
2. **Building with Various Materials:** Students will build models and test solutions with various materials including paper, LEGOs, and others.
3. **Testing and Iterating the Design:** Students will test their model builds, and rebuild as needed based on the test results.
4. **Additional Challenges:** For advanced students, they will be given additional challenges for their builds.

Supporting NGSS & Common Core Standards:

HS-ETS1-2 Engineering Design
Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.