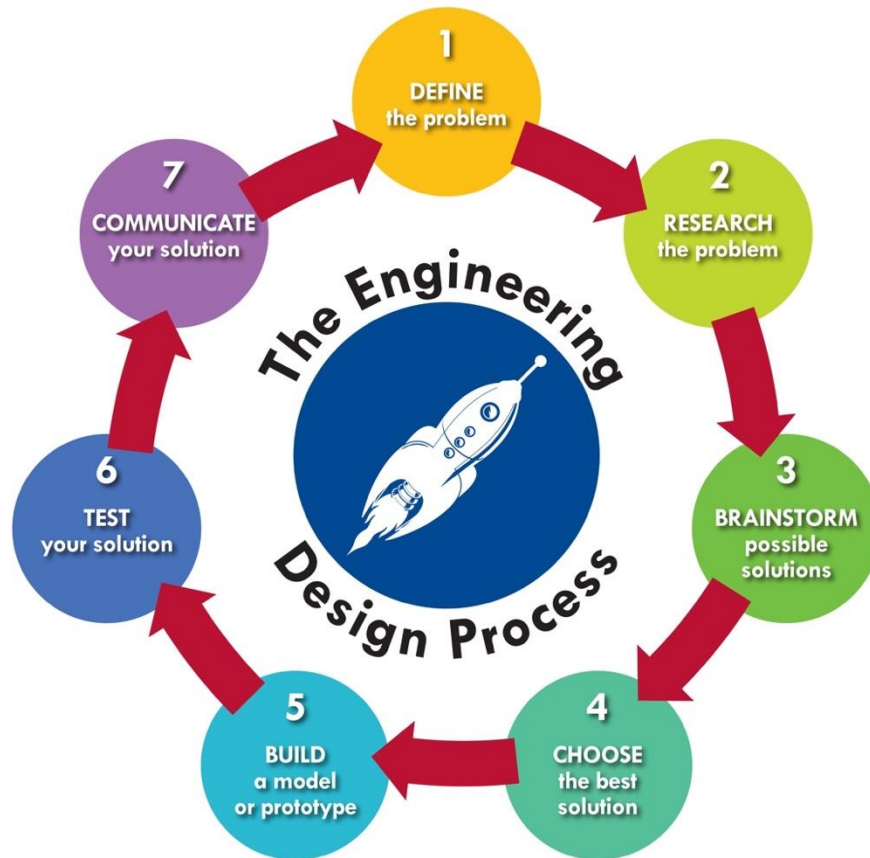


Solve It: A Student **STEM** Challenge



Topic: Unstructured time and Recess at schools

Challenge:

To designing a solution to how much time should students have for recess and unstructured time during the school day.

Materials:

- Computers for research
- School schedules
- Paper or Whiteboards for brainstorming and sharing of ideas
- Optional materials for brain break activities

Real World Connection:

- Shape America: <https://50million.shapeamerica.org/2017/11/program-proves-more-recess-improves-academic-performance-and-behavior/>
- Senate Bill 1083 requires recess in schools: <https://www.azleg.gov/legtext/53leg/2R/bills/sb1083p.pdf>
- The Benefits of Recess: <https://www.youtube.com/watch?v=igqQ7GrcinE>
- Recess Resources: <https://www.azed.gov/hns/recess/>
- Problem Solving through perspective change: <https://www.youtube.com/watch?v=TEJFrBJCvW8>
- The Reframing Matrix: Put your problem into perspective: <https://www.youtube.com/watch?v=N1-d5vK6XwE>
- Psychology of Problem-solving: <https://www.youtube.com/watch?v=vg936IW9i7Q>
- **Below are some amazing resources from Playworks that a school from Littleton is using*

- Game Guide – Our game guide is free for anyone to download and use. It has over 300 safe, healthy and inclusive games. <https://tracking.cirrusinsight.com/6a6571ac-b307-47bc-999a-15d0d66965b6/playworks-org-resources-playworks-game-guide-2>
- Game Library – This is a great resource because you can search for specific games using filters like age, equipment, etc. <https://tracking.cirrusinsight.com/6a6571ac-b307-47bc-999a-15d0d66965b6/playworks-org-game-library>
- [PlayworksU](#) – This is our online training and support program. Right now anyone can access [three courses to try out for free](#) (Playworks101, Attention Getters, Readiness Games). Once activated, you have two weeks to use them. <https://www.playworks.org/services/online-learning/>
- **Here are also a few videos from PlayworksU on youtube:**
- Signals- <https://www.youtube.com/watch?v=loNnSZLtmq8&feature=youtu.be>
- Transitions- <https://www.youtube.com/watch?v=7W7yRxGH1BU&feature=youtu.be>
- Conflict Resolution- <https://www.youtube.com/watch?v=q9krDQ6eufY&feature=youtu.be>
- [Recess Checkup](#) – Our checkup takes just 3 minutes to complete and based on the scores the person taking it will receive targeted tips and resources sent straight to their inbox that can be used immediately. <https://www.recesslab.org/checkup/>
- [RecessLab](#) has great resources, videos, etc. that we love too. <https://www.recesslab.org>
- [Playworks game videos](#) - A lot of games are now videos on youtube. This channel has 16 that schools can show to students to teach them games.
- STEM Pro Live! with Palo Verde Generating Station: <https://schoolsup.org/stemprolive/>

Define the Problem:

Guided Questions	Teacher Notes
<ul style="list-style-type: none"> • What do you have available to work with when designing your solution? • What would a successful solution look like? How will you know if your design is successful? • What are your constraints or limitations? 	<ul style="list-style-type: none"> • Establish your parameters (groups, roles, time limit, # of trials, amount of material allowed to use, etc.). • Taking your students through the Engineering Design Process will vary depending on your school's current schedule. • How often are students given unstructured time for physical activity and social interactions? • How long are passing periods and lunch breaks? • How sets your schedule? (School, district) • What type of supervision is needed during unstructured times and who is responsible?

Research the Problem:

Guided Questions	Teacher Notes
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<ul style="list-style-type: none"> • What is already known about the problem? • What are some current solutions that can be built upon/improved? • What technology is available to help you understand the problem better? • What are some obstacles, challenges connected to your problem? 	<p>Once you have narrowed down the problem you want to solve you will want to identify what solutions currently exist to decide how to implement or improve a solution.</p> <p>This is a great time to show them the benefits and limitations of the different modes of communication.</p>
Brainstorm Possible Solutions:	
<u>Guided Questions</u>	<u>Teacher Notes</u>
<ul style="list-style-type: none"> • How many ideas can you come up with individually? • How many ideas can you come up with as a group? • How can you use/build on the groups ideas to refine your own? 	<ul style="list-style-type: none"> • Have students individually come up with at least 4 possible designs that they could use in their solution • Have students share designs with a group. <i>*Encourage a variety of ideas and a safe environment.</i> • Encourage reflection and refinement of ideas
Choose the Best Solution:	
<u>Guided Questions</u>	<u>Teacher Notes</u>
<ul style="list-style-type: none"> • Which solution(s) could you build using the materials/time you have available? • Which solution(s) could you build considering the constraints/ limitations? • Which solution do you think has the best chance to be successful? 	<ul style="list-style-type: none"> • Have students choose an idea to design and make a plan to build/create (<i>*even if you have no intention to actually build</i>). • Have students draw a model of their prototype and label the parts (<i>*if applicable</i>). • List the materials that will be needed to build (<i>*if applicable</i>). • Describe how the materials will be used.
Build a Model or Prototype:	
<u>Guided Questions</u>	<u>Teacher Notes</u>
<ul style="list-style-type: none"> • What materials will you need? • Does your design meet the lesson objective? • Does your design clearly communicate your selected solution to the problem? 	<ul style="list-style-type: none"> • Revisit the objective and make sure the student's design matches what they chose for their solution to the problem.
Test your Solution:	
<u>Guided Questions</u>	<u>Teacher Notes</u>
<ul style="list-style-type: none"> • Did you record your observations? • How will you know if your design worked as intended? • How will you know if your design was successful? 	<ul style="list-style-type: none"> • Have students make and record observations during their trial(s).

	<ul style="list-style-type: none"> • Encourage students to stay true to their design and not make modifications while testing.
Communicate your Solution:	
<u>Guided Questions</u>	<u>Teacher Notes</u>
<ul style="list-style-type: none"> • Did your design work as intended? How do you know? • Did it solve the problem that you identified? How do you know? • Do you still think your solution is the best one for the problem? Why or why not? • What would you do differently if you could do it again? Why? 	<ul style="list-style-type: none"> • <i>Have students reflect individually first and record responses.</i> • <i>Have students share responses with their group then whole class.</i> • <i>To make iterations, you will want to re-enter the Engineering Design Process and begin thinking about defining the problem(s) they had with the initial idea.</i> • <i>The purpose is to provide a process for them to formalize their thinking and not rely on trial and error to merely accomplish a task.</i> • <i>Share your students' designs and ideas with us at: stem@maricopa.gov</i>