

Lesson Plan Template

Grade: First		Subject: Science	
Materials: Stem Fairytale Kits, science journals, pencils, engineering design process		Technology Needed: active board	
Instructional Strategies: <input type="checkbox"/> Direct instruction <input checked="" type="checkbox"/> Guided practice <input type="checkbox"/> Socratic Seminar <input type="checkbox"/> Learning Centers <input type="checkbox"/> Lecture <input type="checkbox"/> Technology integration <input type="checkbox"/> Other (list) <input type="checkbox"/> Peer teaching/collaboration/cooperative learning <input checked="" type="checkbox"/> Visuals/Graphic organizers <input type="checkbox"/> PBL <input type="checkbox"/> Discussion/Debate <input type="checkbox"/> Modeling		Guided Practices and Concrete Application: <input type="checkbox"/> Large group activity <input type="checkbox"/> Independent activity <input checked="" type="checkbox"/> Pairing/collaboration <input type="checkbox"/> Simulations/Scenarios <input type="checkbox"/> Other (list) Explain: <input checked="" type="checkbox"/> Hands-on <input type="checkbox"/> Technology integration <input type="checkbox"/> Imitation/Repeat/Mimic	
Standard(s) K-2-ET1 - 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.		Differentiation Below Proficiency: Students will be given a graphic organizer with the steps to help keep them on track. They will be paired with an approaching proficiency. Above Proficiency: Students will be placed with a fairytale that we didn't read. If they complete the process early they will be challenged to find a second solution that works and create it. Approaching/Emerging Proficiency: Students will complete the activity as is. Modalities/Learning Preferences: Visual – Sketch of their design, Cards from kit Kinesthetic – Working with the materials Auditory – Class discussion, explanations, group work collaboration	
Objective(s) By the end of the lesson the student will make observations and solve a problem through designing an object to solve a problem out of the materials provided. Bloom's Taxonomy Cognitive Level: Creating			
Classroom Management- (grouping(s), movement/transitions, etc.) Students will start whole group. Teacher will then give them partners and send them to a station. After some time working we will go back to the carpet and discuss the progress. Then we will transition by sending the different stories each to their workspace. Then we will come back together at the carpet and we will discuss the whole process. Students will partner up and share with another group. After they are finished they will come back to the carpet for the wrap-up.		Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) Students will be expected to be engaged in the lesson. They will have a zero voice level at the carpet during explanations. They can have a level 2 voice while working with their partners. Students will be expected to be using the materials to design and build a structure, not for playing.	
Minutes	Procedures		
	Set-up/Prep: <ul style="list-style-type: none"> Gather stem fairytale boxes, have display of engineering process and book 		
5-10 min	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) <ul style="list-style-type: none"> "Today we are going to be reading a fairytale. Has anyone ever heard of fairytales? I am sure a lot of you have right, thumbs up if you have. Can anyone tell me what a fairytale is?" Wait for student response. "A fairytale is a magical story that often has magical creatures such as fairies, giants, talking animals, trolls, or others. It's often a story that teaches a lesson. Some other examples are Cinderella, Goldilocks and the Three Bears, and Rumpelstiltskin. Today we are going to read the story <i>The Three Little Pigs!</i> I'm sure you've read this story before, but today we are reading it because we are going to be engineers. I want you to be watching throughout the story for how the three little pigs are engineers. Watch how they create their designs, what they do when it doesn't work." Read Story and have some discussion about the book. 		
5 min	Explain: (concepts, procedures, vocabulary, etc.) <ul style="list-style-type: none"> "Now that we have read this story I have some problems for you to solve. There are bins around the room, each of a different fairy tale story, that have a problem for you to solve. You will have to design a solution to what it is asking. For example, you will design a chair that can support baby, mama, and papa, at different times." "Before we can think about this we have to think about how we design something. Does it work best to think of an idea and immediately start building it?" Wait for student response. "No, it might work but the best thing to do would be to plan out the idea. What are some different ways you could plan out an idea?" Write the steps, draw a picture, etc. "There are steps to the engineering design process and today you are going to be engineers so we are going to follow that process. The first step is to ask. What is our problem? We have three different problems around the room, to build a chair for the bears, build a house for the pigs that won't break with wind, and get the gingerbread man across the river. So step 1 is done. Next is to come up with ideas. So you and your group will think of different ways to solve your problem. Step 3 is to plan. During this step you will pick which of the different ways you are going to use and create. Then you will draw a picture of your 		

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	<p>design.” Give me a thumbs up if you’re with me. “So we have ask, ideas, plan. Our next step is to create so you will create your plan. We are going to stop with this step for now and we will come back to the next four later.”</p> <ul style="list-style-type: none"> • “I have 9 stations for the three different problems: build a chair that won’t break, build a house that won’t break and get the gingerbread man across the river. I am going to split you into groups of 2 or 3 to a station. Once you are at your station you and your partner will talk about what the problem is and come up with different ways to solve it, the ideas step of the design process, you are going to put this on the back of your paper. You will not be working with the materials yet; you may look through them but we can’t start creating until we have a plan. What is your job when you get to your station?” Find the problem and come up with ideas for a solution on the back of the paper. • Disperse students by group to the different stations. Once they get to station they will not be using the materials/building but rather coming up with different ideas.
<p>35 – 40 min</p>	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <ul style="list-style-type: none"> • “I’ll have your attention in 3,2,1. Now that you and your partner have had time to come up with different ideas you need to pick one solution. Once you have your solution you will draw a design of it on your paper in the first box. When you have completed that raise your hands and I will come look at it.” Allow students time to work • “Eye’s on me.” “Let’s look back at our engineering design process to see where we are at. What have we completed so far?” Wait for student response. “Right we have completed 1, 2, and 3. So now we are at Step 4 and 5, create and test. You can follow your design and create your design, you will then test it to see if worked for the problem. You may begin.” • Allow students time to work. Call students back to the carpet. • “Engineers I have seen some great designs! Remember we were in the create and test steps, some of you maybe are even in the next steps. Now that you have tested yours I want you to reflect on your paper how it went. Did everything work? Or do you have new ideas of how you could change your design. <ul style="list-style-type: none"> ○ Depending on how students are doing - Step 6 is to improve your design. So for me I had to change my plan during my testing because I realized the chair was still going to break because... What are some of your reflections, what is going well, what have you noticed you need to change?” Allow students time to respond. Have discussion of how students’ projects are going. • “Now you are going to go back and either finish creating, testing, or improving your design. Write down on your paper what is, isn’t working, and” Allow students time to work. <p>If time:</p> <ul style="list-style-type: none"> • “You have all tested your designs and have improved them. Your team is going to partner up with another team who has a different fairytale. You will each share you design, how it worked, and what you changed about it.” <ul style="list-style-type: none"> ○ Allow students time to discuss • “This design process can be used in our everyday lives. When we have a problem or something we need to fix we come up with different ideas for how to fix it. Then we choose one and see if it works. If it doesn’t we think of ways to improve it.” • “Now we are going to take a gallery walk around the room because I know you would like to see how everybody solved the different problems we had.”
<p>2 min</p>	<p>Review (wrap up and transition to next activity):</p> <ul style="list-style-type: none"> • “Thinking about what you have completed today. You came up with a solution to a problem and made it better. You should be proud of yourselves engineers!” • “Can anybody share one thing that they learned today?” Allow for student response. • “Like you said your designs didn’t necessarily work the first time, this is just like real engineers, their designs don’t always work the first time but then they keep trying and figure out another way to make it work.”
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc. Check in strategies – checking their design sketch, thumbs up/thumbs down, reflecting on where they are after the planning stage</p> <p>Consideration for Back-up Plan: Students can use different materials such as straws, cups, bowls, paper,</p>	<p>Summative Assessment (linked back to objectives) End of lesson: Students will have created a design that solves the problem they were posed with.</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>

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etc. if the kits aren't available.

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

This lesson went really well! I would definitely do again! It could be adapted for many different grade levels. The students were engaged throughout the entire lesson!

Beginning the lesson with a fairytale, I think was a good engage strategy. I read the *Three Little Pigs*, I realized while reading that they were using the building and design process just like the students would be. So at the end of the story I mentioned that to the students, just briefly. I have changed the lesson so if I taught this again, I would introduce what we are doing (being engineers, designing and creating), then I would explain to the student that I want them to be watching in the story how the pigs are engineers and what they do when their design doesn't work and why the brick house does/works. This would provide more purpose for reading the story. I would also make sure that I am stopping during the story. I didn't do that during this lesson, however the students were still really engaged.

After the read aloud I talked to the students about the engineering design process. Having the image on the flipchart was really helpful. This allowed the students to see how the process works in a life cycle format. I think it was also a good level for the age of the students. If I was to teach this lesson again, I would keep this part very similar. I think the amount of content covered was good for their age. They were able to understand the first three steps that we talked about. I think this was easy for them to grasp when I related it to their writing and how we are learning about the importance of planning before beginning.

I then explained to the students what we were going to be doing. I explained all of the different problems for the students. Then explained to them what they were to do right away. Breaking them up into groups didn't work as planned. I was trying to use the sticks but that didn't work the best. If I taught this lesson again I would figure out a different way to do it. I would still want to pair up students who are higher, so I can put them on the more difficult challenge and lower so I could put them on a challenge that they could be successful with. However, doing this with sticks wasn't the best. I was very surprised that some of my lower students, who I didn't expect to do as well, were very successful with figuring out a solution. I would make sure if I taught this lesson again that I would still require the students to show their design before creating. The students were really good about not working with the materials until I gave them the okay. I liked this because walking around and listening to different students, so much thinking was going into the process before they started.

The kits challenged the students and required them to think, which I really like. There wasn't one student who wasn't stumped at all. I think this is a good thing. I also really liked how the students learned early on while working that they will have to improve their design and that is okay.

The timing of this lesson was fairly accurate. Once students started to finish I had a few of them share their designs with others who worked on the same kit. This was good because they were able to see that there was a different way to solve the same problem. After that when I noticed more students finishing, I had them do almost a gallery walk around the room to look at all of the different designs. I could tell they wanted to see the kits that they weren't working with. If I taught this lesson again I would maybe figure out a way that they could rotate or do a continuing lesson the same day where they could work with a different kit, since that would get really long.

After this I had the students clean up and come to the carpet for closure. I had the students share about how this worked for them. I would definitely do this again because they students all talked about how something didn't work and that then they had to do something else to figure it out, but they were so proud that they did! I added in the connection to real-life, that engineers do the same thing – that it doesn't work right away, so they improve their designs.