Fairy Tale STEM: Jack and the Parachute

PARACHUTE CHALLENGE

Created by Sarah Wiggins
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Jack and the Parachute

Oh no! Jack has done it again. He can't resist magic beans, and he is once again being pursued by the giant. The giant, having learned from past mistakes, has lined the beanstalk with barbed wire. Jack needs another plan of escape. That's where YOU come in.

Your challenge:
Build a parachute to help Jack escape from the giant.

Constraints:
* Your parachute can be no larger than the top of your desk.
* You must have string or some way to attach the parachute to Jack.

Success Criteria:
Your parachute should hold Jack in the air longer than the control drop.
Jack and the Parachute

ASK
How can I create a parachute for Jack?

CONTROL
Drop Jack from the designated height with no parachute. Measure the time it takes for him to hit the ground.

Control Drop Time? __________

IMAGINE
Now think about ways that you can keep Jack in the air longer than the control drop. Brainstorm materials and shapes that would make a good parachute.

CREATE
Create your parachute, and sketch your design. Label your diagram with the materials that you used.

TEST
Trial 1—How long did Jack stay in the air?
Time

Did your parachute fall slower than the control? Yes___ No___

IMPROVE
What can you do to make your parachute better? Try it! Sketch your second parachute. Label the materials.

TEST
Trial 2—How long did Jack stay in the air?
Time

Did your parachute fall slower than the control? Yes___ No___

Did it fall slower than your first parachute? Yes___ No___

REFLECT
Were your changes effective? Why or why not?

Was your parachute a success? Explain.
Jack and the Parachute

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Drop Jack from the designated height with no parachute. Measure the time it takes for him to hit the ground.

Control Drop Time ___________
Jack and the Parachute

Write an explanation or draw a picture that tells what you did to build a parachute for Jack. Then, circle if your parachute was successful or not.

First

Next

Then

Last

Was your parachute a success?  Circle: Yes  No
Jack and the Parachute

Write to explain your thinking and building process for this project.

First I tried

Then I noticed

Next I decided to

Finally I learned

Was your design a success? Circle: Yes  No  Explain:
**Jack and the Parachute**

This is your assessment for your 'Jack and the Parachute' STEM engineering challenge. As engineers, growing and improving is very important so that we can become skilled and model engineers.

<table>
<thead>
<tr>
<th>Engineering Levels:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
</tr>
<tr>
<td>Novice Engineer (7 points)</td>
</tr>
<tr>
<td>Criteria is not attempted or is attempted incorrectly.</td>
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<th>Jack and the Parachute STEM Engineering Challenge Criteria</th>
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<td><strong>Imagine &amp; Create</strong>—Brainstorm multiple possible solutions to meet the design challenge. Discuss materials and shapes to use for the parachute. Create a parachute that meets design criteria (falls more slowly than the control drop) and also adhere to the constraints for time and materials.</td>
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<td><strong>Test, Improve, &amp; Reflect</strong>—Conduct the test carefully by dropping Jack with his parachute and measuring the time it takes for him to fall. Accurately record results of the test. Consider multiple possibilities for improvement, and design a new parachute. Reflect on the successes and failures of your design.</td>
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<td><strong>Participation and Teamwork</strong>—Participate cooperatively with teammates. Contribute ideas and suggestions to the group discussion, and be respectful of the ideas from other group members. Share in the responsibilities of this project. Focus on the task at all times.</td>
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<td><strong>Effort and Determination</strong>—Demonstrate best effort, and maintain a determined attitude. Do not give up when a design flops, but instead keep trying and looking for other solutions. Be willing to try new things and learn from and appreciate both successes and failures.</td>
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Grade: 
Comments:
**Jack and the Parachute**

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<td>Novice Engineer</td>
<td>Growing Engineer</td>
<td>Skilled Engineer</td>
<td>Model Engineer</td>
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<td>Criteria is not attempted or is attempted incorrectly.</td>
<td>Criteria is attempted correctly, and there is room for improvement with the results.</td>
<td>Criteria is attempted correctly and met accurately.</td>
<td>Criteria is attempted and met accurately and in an exemplary way that serves as an example for other engineers.</td>
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### Jack and the Parachute

**STEM Engineering Challenge Criteria**

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**Comments:**
Today, we worked on an exciting STEM Engineering Challenge! We constructed a parachute to help Jack escape from the giant. The challenge was to create a parachute that kept Jack in the air the longest. Here are some ways you can support your child's learning at home:

Discuss it: Ask your child to tell you about the project. Here are some questions to guide you: Was your parachute successful? How could you tell? How long did it stay in the air? Did you try any designs that didn’t work? What did you do to improve your first design? What surprised you about this project? What frustrated you?

Apply it: Have your child tell you different materials from around your house that would or would not make a good parachute.

Try it: Try to repeat the challenge at home. You will need a variety of lightweight materials such as plastic grocery bags, tissue paper, newspaper, and more. You will also need string or even dental floss and an action figure. To test, have a grownup drop the parachute from a high place (playground, window, stairs, chair). This makes a fun family challenge! See who can create a parachute that stays in the air the longest.

If you try this challenge at home, I would love to hear how it goes and even see pictures! Thank you for your support at home 😊