Early Childhood Engineering









Literature & Engineering

Contact:

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Design Challenges Overview

- Goldilocks Design Challenge #1 design and build a chair
- Goldilocks Design Challenge #2 design and build a bed
- <u>Cinderella</u> Design Challenge #1 design and build a means of transportation to get Cinderella to the ball
- <u>Cinderella</u> Design Challenge #2 design and build a cleaning tool to help Cinderella get her work done faster
- Gingerbread Man Design Challenge #1 design and build a way to catch the Gingerbread Man
- <u>Gingerbread Man</u> Design Challenge #2 design and build a way for the Gingerbread Man to get to the other side of the river safely away from the fox
- Three Billy Goats Gruff Design Challenge #1 design and build a bridge across, the stream that will support the weight of all 3 goats and be tall enough for the Troll to stand under
- Three Billy Goats Gruff Design Challenge #2 design and build an Old Troll Home for the troll to live in instead of living under the bridge
- Jack and Jill Design Challenge #1 design and build a water transporter
- <u>Jack and Jill</u> Design Challenge #2 design and build a way for Jack to get down the hill safely without falling
- Humpty Dumpty Design Challenge #1 design and build a way to keep Humpty on the wall so he won't
 fall off
- Humpty Dumpty Design Challenge #2 design and build a way to protect Humpty from getting hurt in case he did fall off the wall
- Hey Diddle Diddle Design Challenge #1 design and build a musical instrument
- <u>Hey Diddle Diddle</u> Design Challenge #2 design and build a device that will help the Cow get over the moon
- <u>Tikki Tikki Tembo</u> Design Challenge #1 design and build a way to keep people from falling into the well while allowing them to access the water supply
- <u>Tikki Tikki Tembo</u> Design challenge #2 design and build a way for Tikki Tikki Tembo to escape from the well without the help of others
- The Mixed Up Chameleon Design Challenge #1 design and build a mixed up animal
- <u>The Mixed Up Chameleon</u> Design Challenge #2 design and build a habitat for the Mixed Up Chameleon
- <u>Tops and Bottoms</u> Design Challenge #1 design and build a place where Bear can sleep that will be outside and fit him comfortably
- Top and Bottoms Design Challenge #2 design and build a maximum yield garden

Goldilocks & the Three Bears - Design Challenge #1

<u>Problem</u>: Goldilocks is inside the bears' house. She is tired and needs a place to rest.

Challenge: Design and build a chair that is just the right size for Goldilocks.

- You may use only given materials in your design.
- The chair must have legs, a seat, and a back.
- The chair must be able to support the weight of a "More Mass" and a "Less Mass" Goldilocks.
- You must design and build within a 20 minute time limit.

PLAN: (What do yo	ou need to know before you beg	gin designing?)
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DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

Concepts/Skills	That	Could	be	Taught	Through	or	Along	with	This	Challenge
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Goldilocks & the Three Bears - Design Challenge #2

<u>Problem</u>: Goldilocks is inside the bears' house. She is tired and needs a place to rest.

Challenge: Design and build a bed that is just the right size for Goldilocks.

- You may use only given materials in your design.
- The bed must have legs, a headboard, and a footboard.
- The bed must be able to support the weight of a "More Mass" and a "Less Mass" Goldilocks.
- You must design and build within a 20 minute time limit.

<u>PLAN</u> : (What do you	need to know before you beg	in designing?)
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DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Cinderella - Design Challenge #1

Problem: Cinderella doesn't have transportation to the ball.

Challenge: Design and build a means of transportation to help Cinderella get to the ball.

Design Criteria

- You may use only given materials in your design.
- The transportation must allow Cinderella to be protected from weather since she will be dressed for the ball.
- The transportation must provide a seat for Cinderella.
- The transportation must include at least one simple machine.
- You must design and build within a 20 minute time limit.

PLAN: (What do you need to know before you begin designing?)

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<u>DESIGN</u> (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- \bullet $\,$ OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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<u>Cinderella - Design Challenge #2</u>

Problem: Cinderella can not go to the ball because she has too many cleaning chores to do.

Challenge: Design and build a cleaning tool that will help Cinderella finish cleaning quicker.

- You may use only given materials in your design.
- The tool must be appropriate for more than one cleaning task and must include more than three materials.
- The tool must allow Cinderella to multitask her cleaning so her chores will be completed faster.
- You must design and build within a 20 minute time limit.

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DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
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This could have been improved during construction:
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CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
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SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Gingerbread Man - Design Challenge #1

Problem: The Gingerbread Man is running away. Challenge: Design and build a solution to catch the Gingerbread Man. Design Criteria You may use only given materials in your design. • The Gingerbread Man must not get hurt in any way. • You must allow at least two of the characters in the story to be part of the solution. You must design and build within a 20 minute time limit. **PLAN**: (What do you need to know before you begin designing?) DESIGN: Part A: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: We chose this design because _____

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:

How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Gingerbread Man - Design Challenge #2

Problem: The Gingerbread Man needs to cross the river to escape from the fox.

<u>Challenge</u>: Design and build a solution for the Gingerbread Man to get to the other side of the river

- You may use only given materials in your design.
- The Gingerbread Man must not get hurt in any way.
- You must allow at least two of the characters in the story to be part of the solution.
- You must design and build within a 20 minute time limit.

PLAN: (What do you need to	know before you begin designi	ng?)
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<u>DESIGN</u> (continued):
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CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Hey Diddle Diddle - Design Challenge #1

<u>Problem</u>: The cat is tired of playing the fiddle and is ready for a change. Challenge: Design and build a new musical instrument for the cat. Design Criteria You may use only given materials in your design. The instrument must be able to make more than one sound. • The instrument must require the cat to use at least two body parts to operate. • You must design and build within a 20 minute time limit. PLAN: (What do you need to know before you begin designing?) DESIGN: <u>Part A</u>: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: We chose this design because _____

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
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If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
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<u>SHARE</u> :
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Hey Diddle Diddle - Design Challenge #2

Problem: The cow is getting older and finding it more difficult to jump. Challenge: Design and build a device to aid the cow in jumping over the moon. Design Criteria You may use only given materials in your design. • The device must keep the cow safe while jumping. • The device must include at least one simple machine. You must design and build within a 20 minute time limit. **PLAN**: (What do you need to know before you begin designing?) DESIGN: Part A: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: We chose this design because _____

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
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This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
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SHARE:
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How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Humpty Dumpty - Design Challenge #1

<u>Problem</u>: Humpty fell off the wall and got hurt. <u>Challenge</u>: Design and build a solution to keep Humpty securely on the wall. Design Criteria: • You may use only given materials in your design. • The solution must keep Humpty safe and eliminate the risk of falling off the wall. • The solution must not allow Humpty to change his body in any way. • You must design and build within a 20 minute time limit. **PLAN**: (What do you need to know before you begin designing?) DESIGN: Part A: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: We chose this design because _____

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
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SHARE:
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Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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<u>Humpty Dumpty - Design Challenge #2</u>

<u>Problem</u>: Humpty fell off the wall and got hurt. Challenge: Design and build a way to protect Humpty from getting hurt in case he falls. Design Criteria: You may use only given materials in your design. The solution must protect all parts of Humpty's body. • The solution may add to, but must not change Humpty's body in any way. • You must design and build within a 20 minute time limit. **PLAN**: (What do you need to know before you begin designing?) DESIGN: Part A: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: _____

We chose this design because _____

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:

CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes,</u> think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
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SHARE:

Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Jack and Jill - Design Challenge #1

<u>Problem</u>: Jack and Jill need to bring water from the well back to their family. Challenge: Design and build a water transporter for Jack and Jill to use. Design Criteria • You may use only given materials in your design. • The water transporter design must show an element of balance. • The water transporter must allow Jack and Jill to carry a large quantity of water with little spillage. You must design and build within a 20 minute time limit. **PLAN**: (What do you need to know before you begin designing?) DESIGN: Part A: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: _____

We chose this design because _____

<u>DESIGN</u> (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
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CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the NESTON and the another design
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
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- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Jack and Jill - Design Challenge #2

<u>Problem</u>: Jack fell down the hill and got hurt as he carried his water.

Challenge: Design and build a way for Jack to get down the hill safely without falling.

- You may use only given materials in your design.
- The solution must keep Jack safe and include at least two changes of direction.
- The solution must allow Jack to carry a large quantity of water with little spillage.
- You must design and build within a 20 minute time limit.

PLAN: (What do yo	u need to know before	you begin desig	ning?)
		_	nd then reach consensus on the ts on the blueprint sketch.)
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DESIGN (continued):
<u>Part B</u> : (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

Concepts/Skills	That	Could	be	Taught	Through	or	Along	with	This	Challenge
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The Mixed Up Chameleon - Design Challenge #1

<u>Problem</u>: The Mixed Up Chameleon is unhappy and wants to be like other animals.

<u>Challenge</u>: Design and create a new animal friend to help cheer up the Mixed Up Chameleon.

Design Criteria

- You may use only given materials in your design.
- The new animal must represent three animal classifications.
- The new animal must be able to swim in the water.
- You must design and build within a 20 minute time limit.

PLAN: (What do you need to know before you begin designing?)

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		utions and then reach consensus on the and parts on the blueprint sketch.)
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DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
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SHARE:
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Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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The Mixed Up Chameleon - Design Challenge #2

Problem: The Mixed Up Chameleon needs a place to live. **Challenge**: Design and create a habitat for the Mixed Up Chameleon. Design Criteria • You may use only given materials in your design. • The habitat must provide for the Mixed Up Chameleon's basic needs. • The habitat must show consideration of safety from predators. You must design and build within a 20 minute time limit. **PLAN**: (What do you need to know before you begin designing?) DESIGN: Part A: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: We chose this design because _____

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
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This could have been improved during construction:
<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

Concepts/Skills	That	Could	be	Taught	Through	or	Along	with	This	Challenge
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Three Billy Goats Gruff - Design Challenge #1

<u>Problem</u>: The Three Billy Goats want to cross the river, but the Troll wants to eat them instead.

Challenge: Design and build a bridge across the stream.

Design Criteria

- You may use only given materials in your design.
- The bridge must support the weight of each goat without going into failure.
- The bridge must be tall enough for the Troll to stand underneath.
- You must design and build within a 20 minute time limit.

PLAN : (What do you need to	know before you begin designi	ng?)
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<u>DESIGN:</u>		
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best design to solve the prob	lem. Label materials and parts	on the diveprint sketch.)
Design #1	Design #2	Design #3
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Our chosen design was # Materials we chose to use:	 ·	
Materials we chose to use		
We chose this design because		

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
a a
This could have been improved during construction:
<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Three Billy Goats Gruff - Design Challenge #2

Problem: The Troll needs a safe place to live.

<u>Challenge</u>: Design and build an Old Troll Home so the Troll doesn't have to live under the bridge anymore.

Design Criteria

- You may use only given materials in your design.
- The Old Troll Home must be big enough for the Troll to live inside.
- The Old Troll Home must have a door, a roof, and at least 2 windows so the Troll can watch the goats cross the bridge.
- You must design and build within a 20 minute time limit.

<u>PLAN</u> : (What do ye	ou need to know before you beg	gin designing?)
DESIGN:	l.	
		utions and then reach consensus on the and parts on the blueprint sketch.)
Design #1	Design #2	Design #3
Our chosen design :		
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We chose this design	gn because	

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No If yes, think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
ou back for all 170 of the best of and my another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

Concepts/Skills	That	Could	be	Taught	Through	or	Along	with	This	Challenge
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<u>Tikki Tikki Tembo - Design Challenge #1</u>

<u>Problem</u>: Tikki Tikki Tembo's brother fell into the well. He does not want anyone else to do the same thing.

<u>Challenge</u>: Design and build a solution to allow the villagers to obtain their water supply from the well while protecting people from falling into the well.

Design Criteria

- You may use only given materials in your design.
- The solution must allow villagers to obtain water from the well's bucket.
- The solution must be able to support the weight of the villager with the most mass.
- You must design and build within a 20 minute time limit.

<u>PLAN</u>: (What do you need to know before you begin designing?)

	-	utions and then reach consensus on the and parts on the blueprint sketch.)
Design #1	Design #2	Design #3
Our chosen design wo		
Materials we chose t	o use:	
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<u>DESIGN</u> (continued):
<u>Part B</u> : (Build the chosen design according to the labeled blueprint.)
This went well during construction:

This could have been improved during construction;

<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
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Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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<u>Tikki Tikki Tembo - Design Challenge #2</u>

<u>Problem</u>: Tikki Tikki Tembo has fallen into the well. No one is around to help him. If he can not escape, he will certainly drown.

<u>Challenge</u>: Design and build a solution for Tikko Tikki Tembo to get out of the well without the help of someone else.

Design Criteria:

- You may use only given materials in your design.
- The solution must not involve another person to help Tikki Tikki Tembo.
- The solution must be able to support the weight of Tikki Tikki Tembo.
- You must design and build within a 20 minute time limit.

PLAN: (What do you need to know before you begin designing?)

DESIGN:		
<u>Part A</u> : (Brainstorm o		utions and then reach consensus on t and parts on the blueprint sketch.)
Design #1	Design #2	Design #3
Our chosen design wa	s #	
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DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
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This could have been improved during construction:
<u>CHECK</u> : (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No
If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
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Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

Concepts/Skills	That Cou	ıld be T	aught	Through	or Along	with Th	is Challen	ge
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Tops and Bottoms - Design Challenge #1

<u>Problem</u>: Bear wants to sleep outside, but he has trouble fitting into the chair. Challenge: Design and build a place where Bear can sleep in comfort. Design Criteria You may use only given materials in your design. • The solution must include Bear staying outside so he can "watch" the Rabbit Family. • The solution must allow Bear to fit comfortably while sleeping. You must design and build within a 20 minute time limit. **PLAN**: (What do you need to know before you begin designing?) DESIGN: Part A: (Brainstorm at least 3 possible design solutions and then reach consensus on the best design to solve the problem. Label materials and parts on the blueprint sketch.) Design #1 Design #2 Design #3 Our chosen design was #_____. Materials we chose to use: _____

We chose this design because _____

DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.) Did the design meet all of the design criteria? Yes No If yes, think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

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Tops and Bottoms - Design Challenge #2

<u>Problem</u>: The Rabbit Family planted two separate gardens to be able to have a variety of vegetables.

Challenge: Design and build a garden that will produce a varied maximum yield.

Design Criteria

- You may use only given materials in your design.
- The garden must include at least five different kinds of vegetables.
- The garden must include plants of varying heights and parts that are eaten.
- You must design and build within a 20 minute time limit.

<u>PLAN</u> : (What do you need to	know before you begin designi	ng?)
DESIGN:		
Part A: (Brainstorm at least 3	3 possible design solutions and em. Label materials and parts	
Design #1	Design #2	Design #3
Our chosen design was #		,
 We chose this design because		
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DESIGN (continued):
Part B: (Build the chosen design according to the labeled blueprint.)
This went well during construction:
This could have been improved during construction:
CHECK: (Test the design according to the challenge and design criteria.)
Did the design meet all of the design criteria? Yes No If <u>yes</u> , think about how you could make additional improvements in design.
If <u>no</u> , think about how it needs to be redesigned.
Go back to Part A of the DESIGN and try another design.
SHARE:
Things we want to share about our design:
How would you rate your team?

- Great- Listened to each other, cooperated, and shared ideas
- OK- Shared ideas, cooperated most of the time
- Needs Improvement- Had difficulties in sharing ideas and cooperating

Co	oncepts/Skil	ls That	Could	be	Taught	Through	or	Along	with	This	Challe	nge:
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