

# BUG OUT BUNGALOW ADVENTURE JOURNAL

TAKING ON THE  
WORLD, ONE  
ENGINEERING  
CHALLENGE AT A TIME

PROPERTY OF THE FUTURE ENGINEER,

# Trying To Get Some Shut Eye!



Hi friends! I am still in Brazil, and I have not had any luck in finding a way out of the rainforest. The forest is so thick that I can hardly even see where I am going, and it is a lot of work to make sure I don't trip or fall into a ditch! I have been trying to find a way out of the rainforest, but I am so sleepy. I can't sleep at night because the ground is cold and wet, and it is very scary. I even tried napping during the day, but the sun is in my eyes. I also can't seem to stay away from critters that are all over the ground. If I don't get to sleep soon, I'm not going to be able to continue my search. If you could help to design a shelter for me, that would be so helpful! I could finally get some restful sleep. Check out the videos I posted online for more details, and let's get those gears moving!

Good luck,

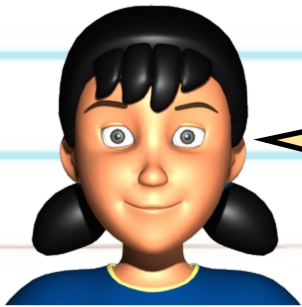
Flynn

# Instructions for GEERlings

## Segment 1—Bug Out Bungalow



Inside Flynn's Supply Sack, you have items that represent things that Flynn either has around her from the environment or things she always carries with her. These will be the only items you can use to solve the problem. Be sure to plan out your design in detail so that there are no materials wasted and the work is completely efficiently! Engineers need to be smart about how they use their resources. Here's what you've got to work with:



Hello GEERlings! I learned that 60% of the Amazon Rainforest is located in Brazil. I hope they are protecting it because it is beautiful!

### Material:

### What it Represents:

Shower Curtain (Two 4x4 Pieces)	⇒ Piece of Flynn's Raincoat
Plastic Wrap (Two 4x4 Pieces)	⇒ Spider Webs
Tape (1 container)	⇒ Palm Leaves Covered In Sap
Index Cards (5)	⇒ Tree Bark
Toothpicks (20)	⇒ Twigs
Straws (10)	⇒ Bamboo
Pipe Cleaners (5)	⇒ Vines
Wires (4 Pieces)	⇒ Spokes From A Bike
Comb (1)	⇒ Hair Comb That Flynn Found
Popsicle Sticks (10)	⇒ Logs
Rubber Bands (4)	⇒ Bungee Cords
Clothes Pins (5)	⇒ From Flynn's Supply Sack

You can also use scissors to complete the activity. Have fun, and don't be afraid to think outside the box!

# Your Challenge

## Segment 1—Bug Out Bungalow



Create a study shelter that can keep Flynn off of the ground and dry. Using the materials, design a shelter that Flynn can sleep in. Your design must keep Flynn dry and shady. It must also be off the ground to keep all the rainforest critters away!

All of your ideas should be your own. Don't be afraid to think outside of the box!

Before you start working, see if you can plan what you think your solution will look like in the space below.

Oh, and don't forget to HAVE FUN!

My solution will look like this and I will use the materials listed below to build it:

- ☐ Shower Curtain
- ☐ Plastic Wrap
- ☐ Tape
- ☐ Index Cards
- ☐ Toothpicks
- ☐ Straws
- ☐ Pipe Cleaners
- ☐ Wires
- ☐ Comb
- ☐ Popsicle Sticks
- ☐ Rubber Bands
- ☐ Clothes Pins

# Let's Engineer It!

## Segment 2—Bug Out Bungalow



Flynn needs a sturdy shelter so she can rest, stay dry, and get off of the ground. Since Flynn has done research on living in wet climates before, her engineering intuition tells her that a pitched roof and stilts would help her stay dry in this climate. The stilts would get her off of the ground, and the special roof would help the water run off of the top, almost like an umbrella! Your job is to answer the questions below which will help you design a sturdy shelter.

Sugar Loaf Mountain, in Rio de Janeiro, is a volcanic plug. Curious what that means? Research it during this phase!



You can use websites to find out more about how a pitched roof and domes work.

Take notes while you research, but only write notes that make sense to you. Don't write something that you don't understand or can't explain in your own words. If it helps you, you can also draw pictures about the things you learn.

1. What is a pitched roof? What is another name for a pitched roof?

2. What does a pitched roof look like? Why does it look that way?



3. What is a truss? How does it help hold up a pitched roof?

4. How could a pitched roof with trusses help Flynn?



5. How are shelters at the beach and in the bayou raised off of the ground?



6. What materials work best for raising a small shelter off of the ground?



7. How can trusses help keep the shelter sturdy?

8. How will Flynn benefit from having a raised shelter?



9. Make a list of all the ways you can prevent bug bites.

10. What could you build to help prevent the bugs from biting Flynn?

11. What other types of roof structures are there and when are they used?

12. What type of engineer would know a lot about trusses?



Now that you've researched and learned more about trusses and roofs, try to use your new knowledge to see if you can redesign your initial solution to be even better! Draw a new picture of it if that helps you figure out what modifications need to be made!





# Let's Put It All Together!

## Segment 3—Bug Out Bungalow



Okay GEERlings, now that you have learned how to build a great shelter, it's time to use that information and your creativity to stop bugs and rain from reaching Flynn. If your shelter can stay dry on the inside when you put 5 drops of water on it, then it will certainly keep Flynn dry while she sleeps! In addition, try to fit a pen or pencil under the shelter to see if it is far enough off of the ground. And remember, it should also be shady to keep me safe from the sun!



Let's review what you designed during the last session of this quest. Are there any changes you want to make? See if you can draw your design one more time, and this time, label the materials you will use!

I think I can build my shelter like this, using these materials:

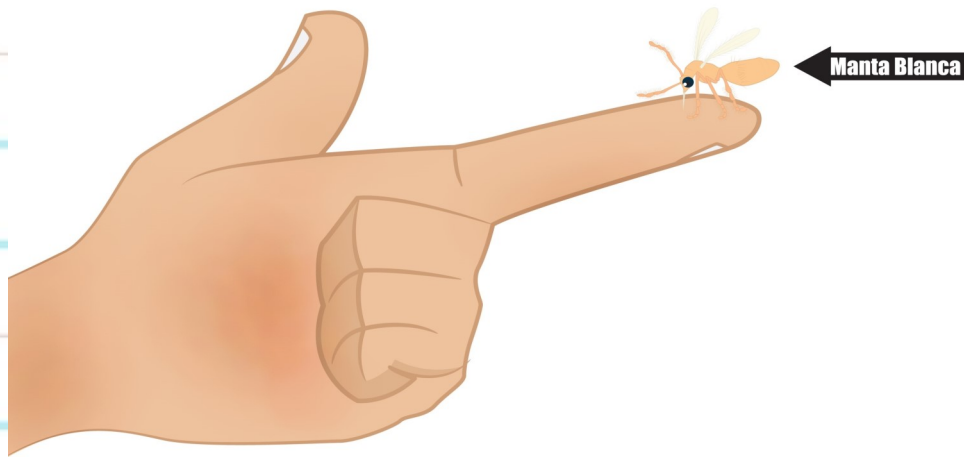
- ☐ Shower Curtain
- ☐ Plastic Wrap
- ☐ Tape
- ☐ Index Cards
- ☐ Toothpicks
- ☐ Straws
- ☐ Pipe Cleaners
- ☐ Wires
- ☐ Comb
- ☐ Popsicle Sticks
- ☐ Rubber Bands
- ☐ Clothes Pins

# GEERling Vocabulary List

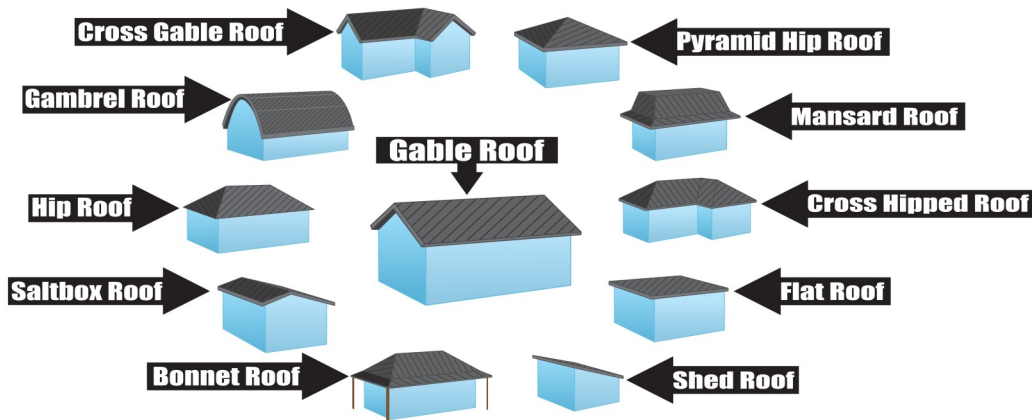
## Bug Out Bungalow



**Manta blanca**: a small, bloodsucking insect, similar to a mosquito that can leave bites that last up to several days or weeks. The bites itch and if scratched, can become infected. They are also known as sandflies or midges.



**Pitched roof**: a roof that has a high point in the center and slopes downward toward the outside, in the shape of a triangle. Also called a gable roof.



# GEERling Vocabulary List

## Bug Out Bungalow



**Stilts**: tall poles that are under a building to hold it up of the ground. Buildings with stilts are usually built in areas prone to flooding or out over the water like in the picture below.



**Truss**: planks that fit together in diagonal shapes to improve that strength of a structure or roof. There are multiple patterns that can be built and some are seen below.

