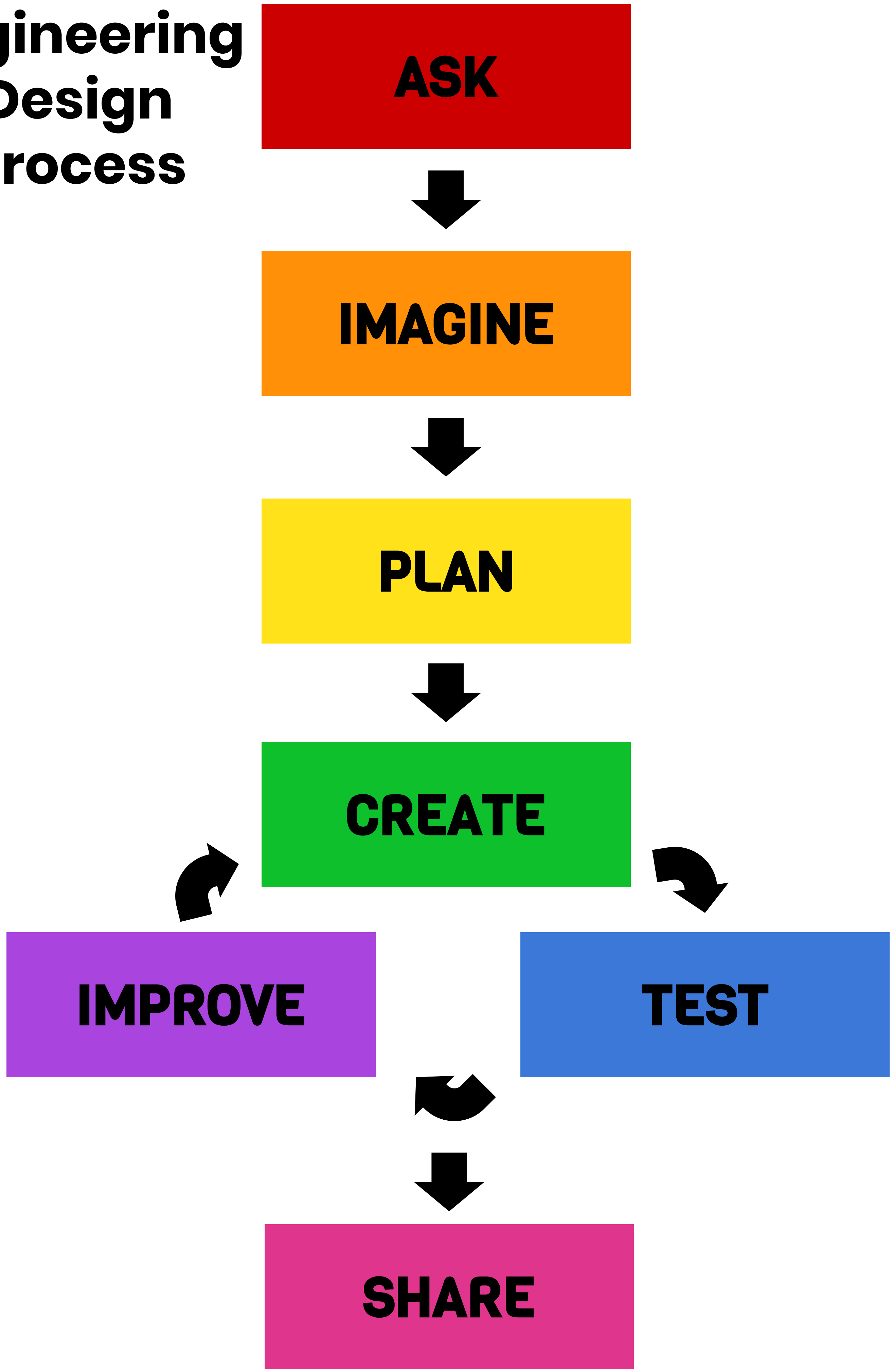
STEM CHALLENGE Journal

STEM CHALLENGE: **LAUNCH IT**

This journal belongs to: Terriann Weisenberg and Student Samples

Engineering Design Process



Ask

Identify the problem:

The engineering design challenge is to design and build an air-powered rocket that can hit a distant target (in this case, the moon) that is 5 feet away.

?

What is the design criteria?

The rocket must have a body; nose cone, which is a seal on one end of the rocket; and be air-powered by a balloon.

?

What are the design constraints?

?

The resources allowed for the air-power is a latex balloon. For the launcher, a thin straw is provided. A wide straw is provided for the rocket body along with tape, 1 sheet of copy paper, and small piece of clay. Scissors, protractors and rulers are provided as tools. The time constraint is that the engineering design challenge must be completed in 90 minutes over the course of 3 class periods.

T. Weisenberg

Ask

Identify the problem:

What is the challenge problem you are trying to solve?

We are trying to get an air-powered rocket to "land" on the "moon." The goal is to hit the target; the moon, which is 5 feet away and has a 2.25 inch radius.

What is the design criteria?

What are the design requirements?

We need to create an air-powered rocket with a nose cone and body, and maybe fins.

What are the design constraints?

What are the limits on the design due to resources and time constraints?

We only have 90 minutes. We are limited to only 1 thick straw, 1 thin straw that can fit inside the thick straw, a 6-inch balloon that stretches as we fill and empty it, 1 piece of copy paper, scissors, a small lump of clay, and tape.

Ethan and Caden

Ask

Identify the problem:

What is the challenge problem you are trying to solve?

We are trying to get a model air powered rocket to hit a distance of 5 foot away moon target.

What is the design criteria?

What are the design requirements?

The air powered rocket that needs a nose cone, a body, and fins. If you fail to do that the first time, you may improve your work until you find a working design. The nose-cone helps it go straight. The fins aren't needed, but recommended, as they help with control.

What are the design constraints?

What are the limits on the design due to resources and time constraints?

The materials we have are a balloon, small lump of clay, 1 sheet of copy paper, 1 wide straw, 1 thin straw that fits inside wide straw tape. The tools that are provided are scissors, protractor, and ruler. We have 90 minutes to complete the project.

Santino and Kai

Ask

Identify the problem:

What is the challenge problem you are trying to solve?

We are challenged to make a rocket out of everyday materials to reach a moon 5 feet away. It is a air powered rocket.

What is the design criteria?

What are the design requirements?

We are required to build a air powered rocket that has a body, nose cone and fins.

What are the design constraints?

What are the limits on the design due to resources and time constraints?

We can use a balloon, a fat straw, a skinny straw, a little bit of clay, scissors, and tape.

We have 90 minutes.

Austin and Cole

Ask

Identify the problem:

What is the challenge problem you are trying to solve?

We need a way to get to the moon.   A.K.A. The target which is 5 feet away. The rocket has to be air powered and has to be made out of household items and materials.

What is the design criteria?

What are the design requirements?

We need to create a rocket with the nose cone, the body, and the fins using some materials.

What are the design constraints?

What are the limits on the design due to resources and time constraints?

Only have 90 minutes. Materials are very limited and we have no money. Materials are balloon, fat straw, skinny straw, clay, tape, 1 sheet of paper. We can also use scissors a protractor and a ruler.

Nette and Shane

Ask

Identify the problem:

What is the challenge problem you are trying to solve?

To design and build an air-powered rocket that can hit a distant target that is 5 feet away..

What is the design criteria?

What are the design requirements?

We need a body and a nose cone. Plus we might need fins.

What are the design constraints?

What are the limits on the design due to resources and time constraints?

It can’t be huge, but shouldn't be really small. It can't be big but also can be tiny. You can use a balloon, clay, thin straw, big straw, clay, tape, scissors, paper, and tape measure. 90 minutes is how much time we have.

Charlotte and Ace

Imagine

Brainstorm all of your rocket design ideas here.

Drag the star near the idea that you think will work.

1. Keep original size of wide straw and fold one end down. Use tape to keep fold down. No fins on the straw rocket.
2. Keep original size of wide straw and fold one end down. Use tape to keep fold down. Tape 2 triangular paper fins parallel to each other at the bottom of the wide straw rocket.
3. Keep original size of wide straw and fold one end down. Use tape to keep fold down. Tape 3 triangular paper fins equal distance apart at the bottom of the wide straw rocket.
4. Cut 1 inch off the wide straw and fold one end down. Use tape to keep fold down. Tape 2 triangular paper fins parallel to each other at the bottom of the wide straw rocket.
5. Keep original size of wide straw and plug one end with small piece of clay. No fins on the straw rocket.
6. **Keep original size of wide straw and plug one end with small piece of clay. Tape 2 triangular paper fins parallel to each other at the bottom of the wide straw rocket.**
7. Keep original size of wide straw and plug one end with small piece of clay. Tape 3 triangular paper fins equal distance apart at the bottom of the wide straw rocket.
8. Keep original size of wide straw and plug one end with small piece of clay. Fold clay end of straw down and tape to stay down. No fins on the straw rocket.
9. Keep original size of wide straw and plug one end with small piece of clay. Fold clay end of straw down and tape to stay down. Tape 2 triangular paper fins parallel to each other at the bottom of the wide straw rocket.
10. Cut 1 inch off the wide straw. Plug one end of straw with small piece of clay. Tape 2 triangular paper fins parallel to each other at the bottom of the wide straw rocket.

T. Weisenberg

Imagine

Brainstorm all of your rocket design ideas here.

Drag the star near the idea that you think will work.

★ Put a thick straw inside of the balloon, then put the thin straw inside of the thick straw, bend the thin straw, blow 10 times to fill the balloon, then launch.

Put the thin straw in the balloon, add the thick straw on the outside of the thin straw, bend the thick straw, blow on the straw 15 times to fill the balloon, then launch.

It takes 10 breaths to fill the balloon with the thick straw, and 15 breaths to fill the balloon with the thin straw.*

*We changed this to 2 breaths for each straw later.

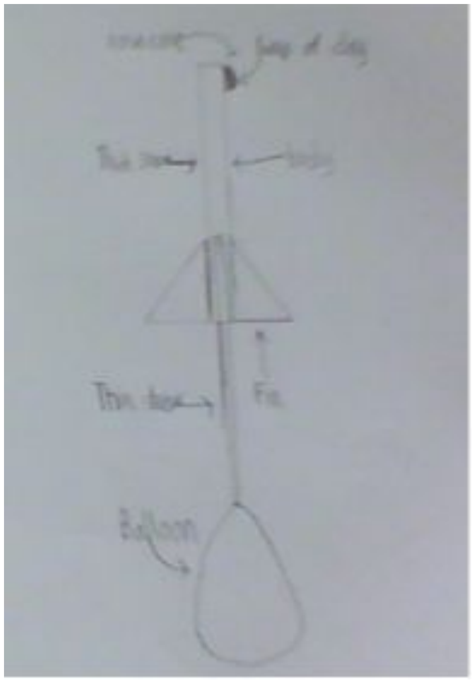
Ethan and Caden

Imagine

Brainstorm all of your rocket design ideas here.

Drag the star near the idea that you think will work.

Our rocket will have four fins that are in the shape of a drawing triangle that has a length of 1 inch each. The balloon should blow up to be about 10 inches wide. Once the balloon is blown up by the thin straw we will insert the thin straw and the balloon in the thick straw. To insure that the air does not come out of the balloon we will have a lump of clay over the end of the thick straw.



Santino and Kai

Imagine

Brainstorm all of your rocket design ideas here.

Drag the star near the idea that you think will work.

1. We will blow up a balloon on a straw and bend the other straw and put clay in it. Also, we will have four fins.
2. We will blow up a balloon on a straw and bend the other straw and put clay in it. Then, we will put clay in the middle to add some weight and add three fins.
3. We will cut up fins on the teal straw. We are gonna cut the top of the red straw into 4 triangles still attached to the straw. Then when that is done we form the triangles into the shape of a cone and keep it together with clay and tape.

Austin and Cole

Imagine

Brainstorm all of your rocket design ideas here.

Drag the star near the idea that you think will work.

The nose cone will be made out of clay and will be taped onto thick straw. The thick straw is 7.8 in. On the bottom of the thick straw there will be a paper wing shaped like an upside down cone. There will be 2 fins on each side, taped down to the straw. Under the thick straw there will be a bendy, skinny one. The skinny, bendy straw is 7.9 in. That straw will have a balloon taped to the end of it. We will blow the balloon up and pinch the top of it so the air doesn't come out! Then we will put the thick straw on top of the bendy, skinny straw and let go of the balloon.

The nose cone will be folded out of paper and the straw. Then the clay will be put in the nose cone to airlock it. Then there will be in the back to weigh it down.

Nette and Shane

Imagine

Brainstorm all of your rocket design ideas here.

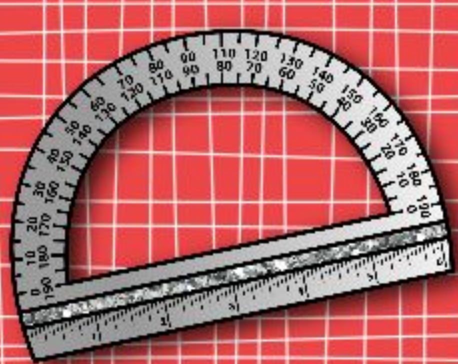
Drag the star near the idea that you think will work.

★ Plug one end of the body with clay and cover with tape
have 3 fins at the bottom.
3 breathes
Cut body to 6 in.

Charlotte and Ace

Plan

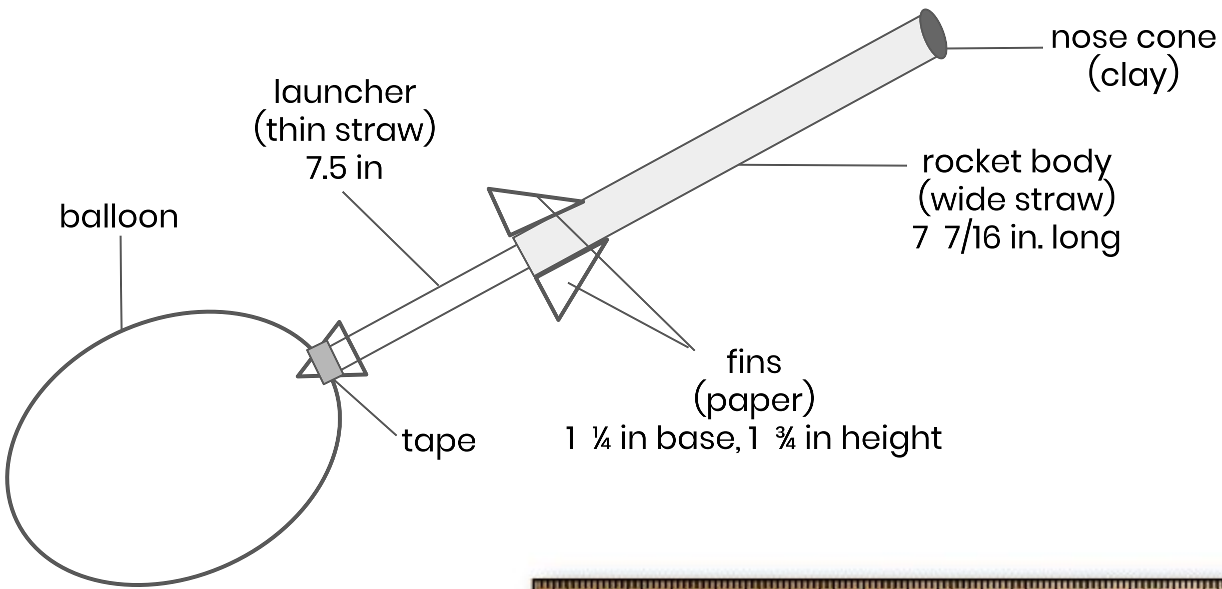
Discuss the idea you picked. What materials will you use? How will it work?



- Wide straw will be the base of the rocket.
- Small piece of clay used to plug up one end of wide straw. This will seal one end so when the air from the balloon is released, the air will stay in the rocket to give it power to move (fly).
- Two fins made out of white copy paper cut into triangles and taped near the opposite end of the nose cone will help with the direction the wide straw rocket moves.

Create a diagram of your plan. Label the parts.

Draw a detailed sketch of your design online or on paper provided. Make sure your sketch has labels and measurements.

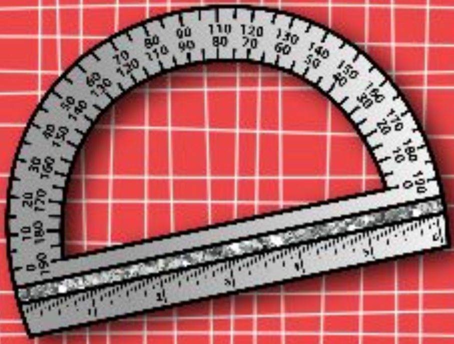


T. Weisenberg

Plan

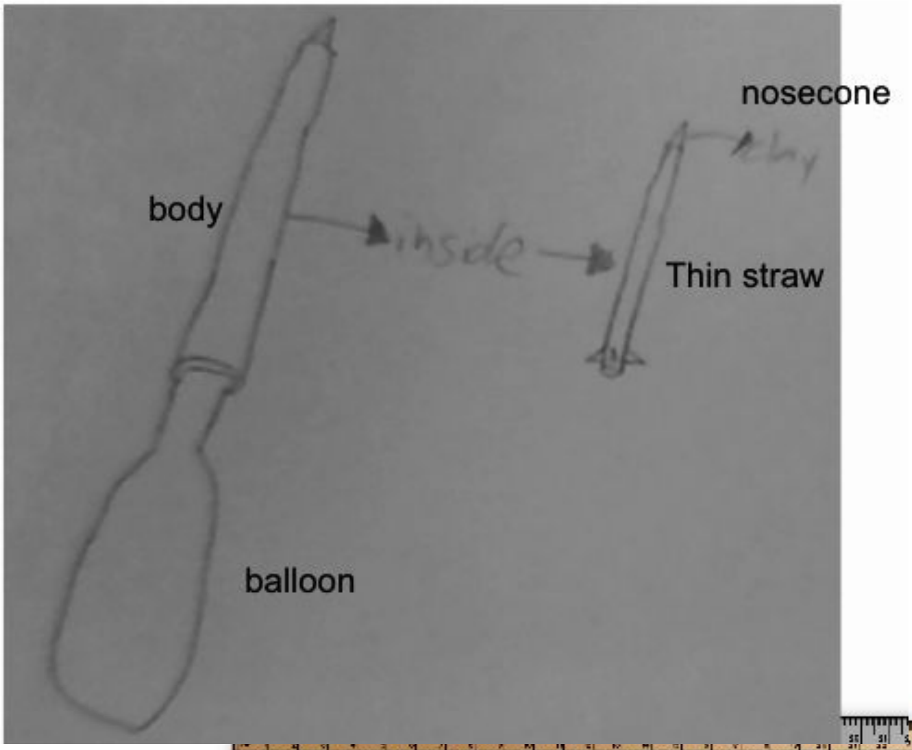
Discuss the idea you picked. What materials will you use? How will it work?

We chose to do my first method on the Imagine page. Caden said that usually the best angle to launch things at is 60 degrees, so I will test that to see if it works.



Create a diagram of your plan. Label the parts.

Draw a detailed sketch of your design online or on paper provided.
Make sure your sketch has labels and measurements.



Ethan and Caden

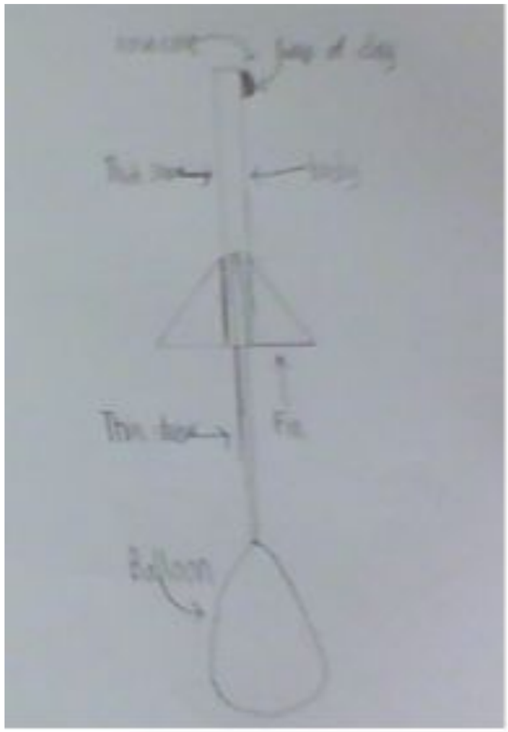
Plan

Discuss the idea you picked. What materials will you use? How will it work?

We will use all the materials that are given to us. Also, all the tools that are provided to us. We will work it at about a 70 degree angle to launch it at the five foot away moon target. We are hoping that the power of our balloon will launch the air powered rocket with the balloon measuring 10 inches.

Create a diagram of your plan. Label the parts.

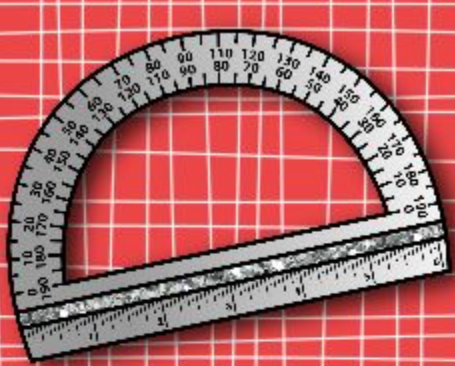
Draw a detailed sketch of your design online or on paper provided. Make sure your sketch has labels and measurements.



Santino and Kai

Plan

Discuss the idea you picked. What materials will you use? How will it work?



Balloon: for power of the rocket

Fat straw: body of rocket and bend top for cone

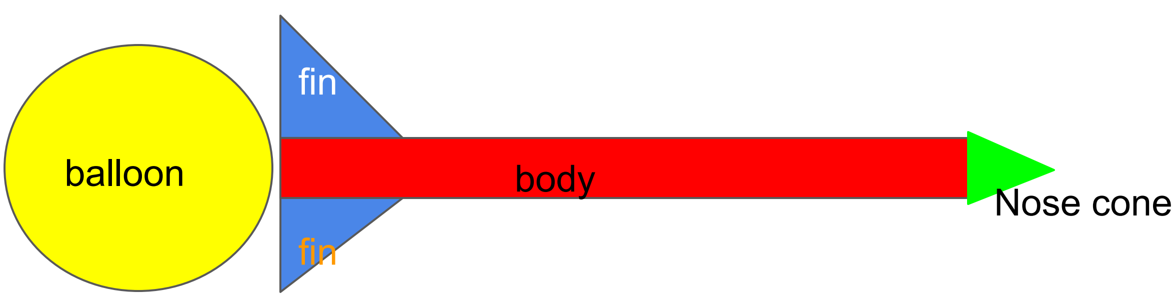
Skinny straw: use to make power for rocket cut to make fins

Clay: to add some weight and keep the cone in shape.

Tape: to tape the fins and nose cone our nose cone is made with paper.

Create a diagram of your plan. Label the parts.

Draw a detailed sketch of your design online or on paper provided. Make sure your sketch has labels and measurements.



The body was about 7 in. long. The nose cone was about 1 in. long. The fins were about 1 and a half in. long.

Austin and Cole

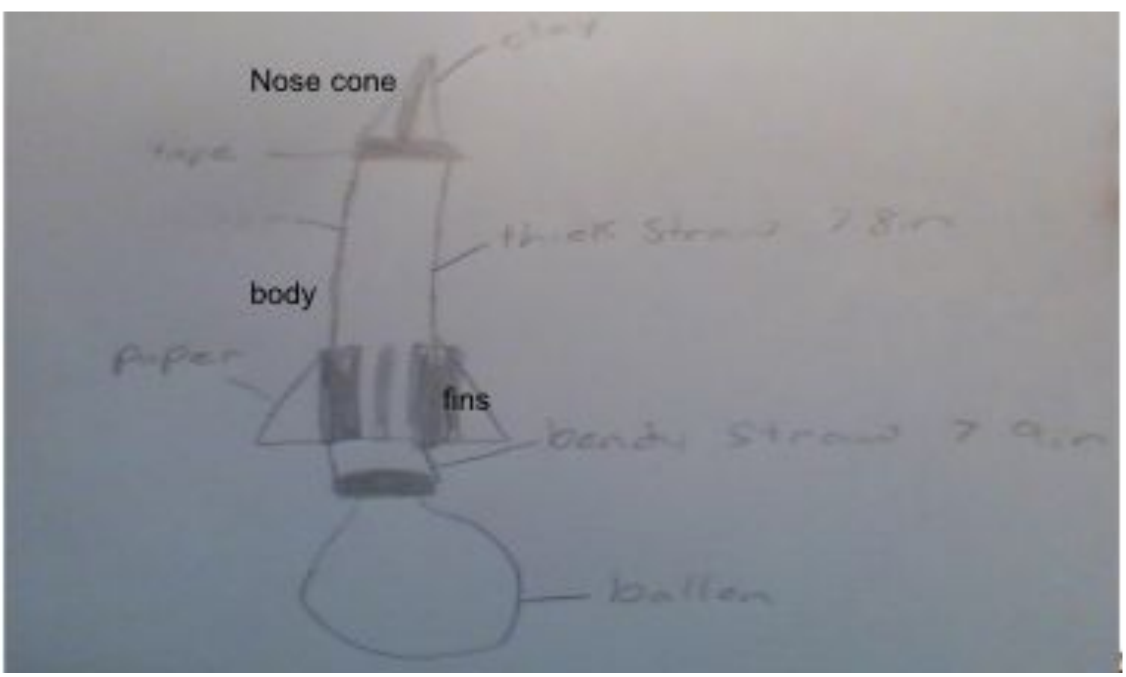
Plan

Discuss the idea you picked. What materials will you use? How will it work?

We will tape will secure all the parts together. The clay will help weigh the straw down and will keep it even. The folded paper fins will also weigh the rocket down. The tape will secure all our parts together.

Create a diagram of your plan. Label the parts.

Draw a detailed sketch of your design online or on paper provided. Make sure your sketch has labels and measurements.



Nette and Shane

Plan

Discuss the idea you picked. What materials will you use? How will it work?

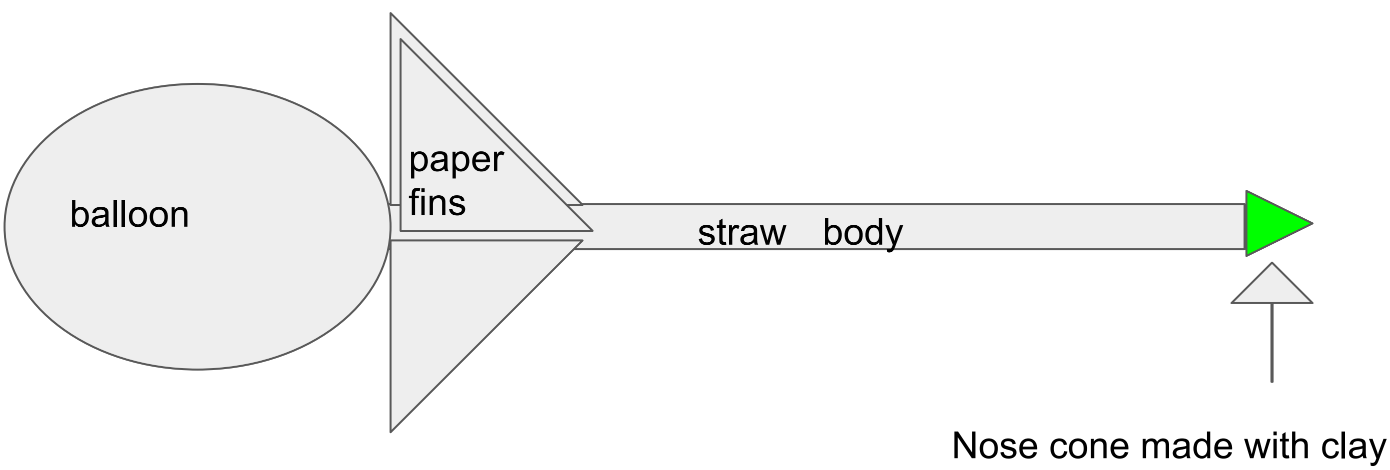
I think it will fly very good.

balloon
Straw
Big straw
Clay
Paper
Tape

The clay will stop the air from going all the the way through the big straw/body
The paper will be the 3 fins the straw is our body and we will put the straw with the balloon in the straw without the balloon because it will fly better. the straw will be 5 inches long.

Create a diagram of your plan. Label the parts.

Draw a detailed sketch of your design online or on paper provided. Make sure your sketch has labels and measurements.



Charlotte and Ace

Create

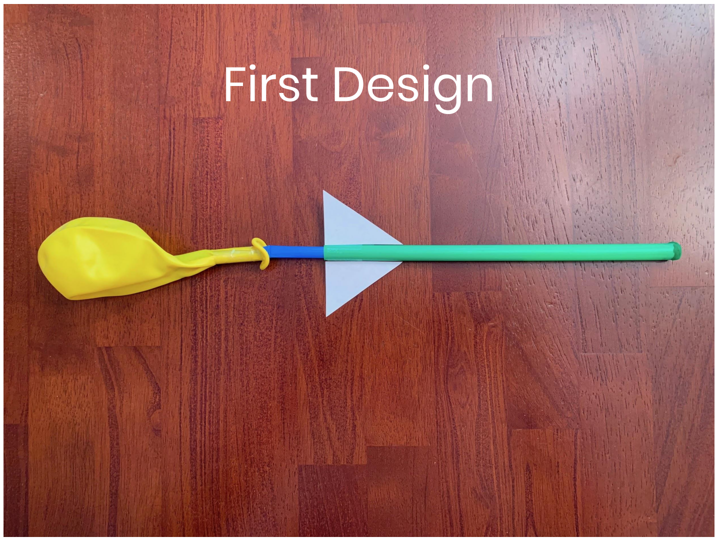
Add a picture or video of your model.

Were you able to build your design from your plan? **YES** **NO**

Did your plan work well? Why or why not?

My plan worked well because I was able to get a small amount of clay to plug one end of the wide straw (rocket) so the rocket did not lose any air power from the balloon. I used a piece of tape on each side of the fins to secure it to the other end of the wide straw (body of the rocket).

The launcher was made by placing the thin straw 2 inches inside the balloon and then taping around the neck of the balloon so no air would leak out of the balloon. The air released from the balloon needed to go through the thin straw.



First Design

Final Design

T. Weisenberg

Create

Add a picture or video of your model.

Were you able to build your design from your plan? YES NO

Did your plan work well? Why or why not?

We put clay on the nose cone.
Our plan didn't work because the air wasn't coming out fast enough. We are still wondering how to improve our design.

Final rocket

Ethan and Caden

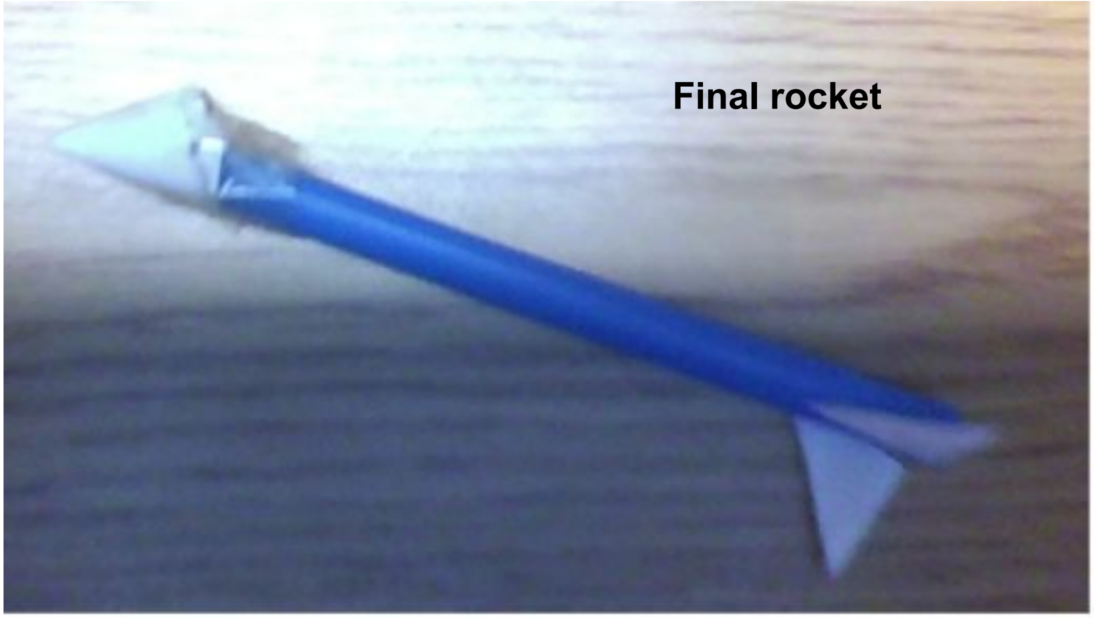
Create

Add a picture or video of your model.

Were you able to build your design from your plan? **YES** **NO**

Did your plan work well? Why or why not?

It didn't work because it never hit our target, the moon. The clay nose cone was too heavy. The rocket angle was not good and we need to fix the fins.



Santino and Kai

Create

Add a picture or video of your model.

Were you able to build your design from your plan? **YES** **NO**

Did your plan work well? Why or why not?

It did not work because we had a long straw and we needed to make the straw smaller. We also had to push the balloon with our elbow.

Final Rocket

Austin and Cole

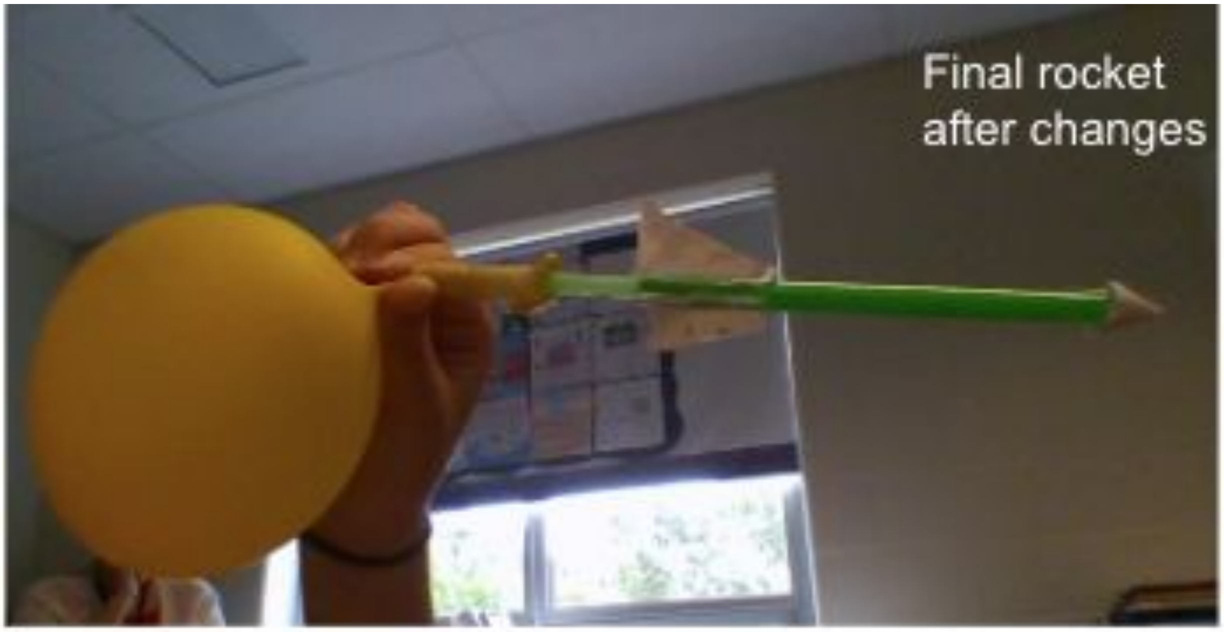
Create

Add a picture or video of your model.

Were you able to build your design from your plan? **YES** **NO**

Did your plan work well? Why or why not?

No. But we almost hit the moon. Our angle was a little off. The angle we used was a 72 degrees. We discovered that if you put less air into the balloon, and you both push on it at the same time, that you will get really close and have a lot of force.



Nette and Shane

Create

Add a picture or video of your model.

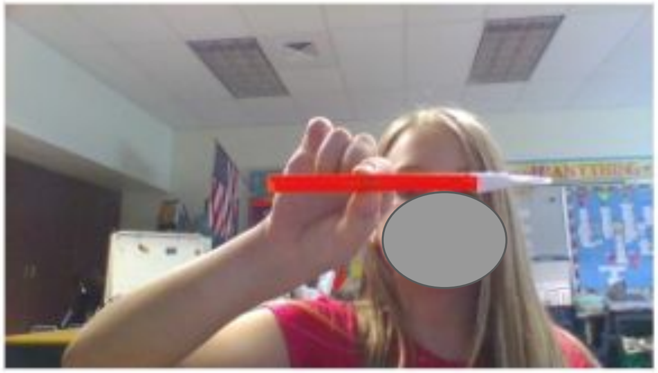
Were you able to build your design from your plan? **YES** **NO**

Did your plan work well? Why or why not?

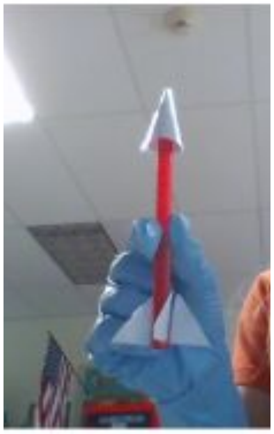
New rocket body is 5 in.
it didn't work well.

Our new design didn't work either. We changed a lot but we could never get the right launch angle, that is all.

First Rocket



Final Rocket



Charlotte and Ace

Test

Test your design.

How did you test your design?

Using the thin straw launcher, I blew up the balloon using 1 big breath and pinched the thin straw so the air would not leak out. Next I slid the wide straw rocket on the thin straw launcher. I measured the angle of launch and aimed at the target (moon). Then I released my pinch on the launcher to air-power the rocket.

Did your design pass the test? YES NO

If not, why not?

When the rocket was at a 60 degrees launch angle, it flew a distance of 1 foot and did not hit the target on the first trial. First, I tried adding 1 more breath (2 big breaths) to the balloon to give it more power and fly a further distance, but keeping the 60 degrees launch angle. The rocket didn't go any further than a foot. Next, I kept the amount of breaths but changed the launch angle to 70 degrees and the rocket went the same distance of a foot. I tried the same about of breaths, but changed the launch angle to 50 degrees and the rocket went a distance of 4 feet so it went further than before. Changing the launch angle to 45 degrees did not change the distance the rocket flew. I tried changing the launch angle to 60 degrees and the distance didn't change.

T. Weisenberg

Test

Test your design.

Continued from previous slide.

Next I decided to change the design of the rocket. I took off the clay at the nose cone because it was making the rocket too heavy and not reaching the 5 foot target. Instead of the clay, I folded down the wide straw 1 cm and used tape to secure it down. With the new design of the nose cone I blew 2 big breaths into the balloon and launched the rocket at 60 degrees. This time I hit the board that the target was on. This design change helped improve the distance the rocket flew. Next, I kept everything the same but changed the launch angle to 70 degrees. The rocket did not go as far on this trial and I noticed the air leaked out of the balloon. I made an entirely new launch/balloon power source. This time I put only 1 inch of the thin straw into the balloon and taped it to secure the air inside the balloon. Using the new launcher and new balloon, I launched the rocket with 2 breaths at 60 degrees but it did not hit the board. I used the same amount of breaths inside the balloon, but changed the launch angle of 70 degrees to launch the rocket. This time the rocket hit the target. I tried again this exact position and amount of air and the rocket did not hit the board. It was 4 inches away from the board. I noticed that I waited too long to release the air from the balloon so the rocket did not have enough air-power . The next trial I kept the launch angle as 70 and 1 breath of air in the balloon. This time the rocket his the board but was a few inches below the target.

T. Weisenberg

Test

Test your design.

Continued from previous slide.

To help with the direction, I made another design change. I added 1 more fin to the bottom. The 3 fins are now placed equidistant apart around the wide straw. I launched the 3 fin rocket at 70 degrees with one breath of air in the balloon. The rocket did not hit the board that the target was on. It was 1 foot away from the board. I decided to make another design change. I removed the third fin and changed the position of the 2 fins. The fins continue to stay on the bottom of the wide straw but I added 2 triangle fins so that they are at a 75 degree angle. With the fins in a new position, one breath of air, and a launch angle of 70 degrees, I launched the rocket. The rocket hit the board but went over the target about 2 inches. I tried again with the same rocket design and air amount but at a 50 degree angle. The rocket hit 1 inch from the top of the moon again. Next, I changed the launch angle again to 45 degrees and kept the same 1 breath of air and rocket design. The rocket hit the target. I tried 4 more launches at launch angle 45 degrees, 1 breath of air, and the rocket design with 2 fins. The rocket hit the target 3 out of 4 times. The one time it didn't hit the target was due to not aiming correctly towards the target.

T. Weisenberg

Test

Test your design.

How did you test your design?

We launched our rocket at a 60 degree angle.

Did your design pass the test? YES NO

If not, why not?

It didn't pass the test because the clay was too heavy which was altering the center of mass; making it unbalanced.

Ethan and Caden

Test

Test your design.

How did you test your design?

We tested it by using a sixty degree launch angle and letting the air into the rocket.

Did your design pass the test? YES NO

If not, why not?

It did not pass the test because it didn't go that far. Our design did not pass the test because I think it was because we did not put pressure on the balloon to launch the rocket and the nose cone weighed too much.

Santino and Kai

Test

Test your design.

How did you test your design?

We tested it by blowing up the balloon and pushing it with our elbow to make it go. The launch angle was 65 degrees for our first launch. The launch that made the best distance was 80 degrees.

Did your design pass the test? YES NO

If not, why not?

We used a lot of tape and rocket body was long so it was heavy.

Austin and Cole

Test

Test your design.

How did you test your design?

First we would put a little air into the balloon. We would get about in the middle of the tape and we would get an angle around 72 degrees. Then Shane would push his elbow into the balloon and I would push the balloon. We would do that at the same time.

Did your design pass the test? YES NO

If not, why not?

You need a lot of air for the balloon to get big. You need the tape really tight .
You need a small nose cone so there's not a lot of weight.
We are sooo close! We are hitting like an inch away from the moon.

Nette and Shane

Test

Test your design.

How did you test your design?

We placed the rocket on the ground and measured the angle then we aimed.

Did your design pass the test? YES NO

If not, why not?

The launch angle was never right. It never hit the target.

Test

Evaluate your design.

During the design process, did you notice when something wasn't working well and then changed your design to make it work better?

YES NO

Give reasons for any design revisions that you made after testing.

The first design change I made was removing the clay at the nose cone because it was making the rocket too heavy and not reaching the target. Instead of the clay, I folded down the wide straw 1 cm and used tape to secure it down. This made the rocket lighter.

The second design change I made was adding 1 more fin to the bottom to help with the direction the rocket was flying. The 3 fins are now placed equidistant apart around the wide straw.

For my last design change. I removed the third fin and went back to only having 2 fins, but I changed the position of the fins. The fins continue to stay on the bottom of the wide straw, but the fins are at a 75 degree angle, making them angle up instead of the sides.

T. Weisenberg

Test

Evaluate your design.

During the design process, did you notice when something wasn't working well and then changed your design to make it work better?

YES NO

Give reasons for any design revisions that you made after testing.

We launched the rocket at a 60 degree angle, and it didn't go far when the balloon was either filled a lot or a little. It turns out, the nose cone was too heavy; the center of mass was too close to it. I will take the nose cone off and remake it out of paper.

On our third attempt, we had the same result. However, we found that if we fill the rocket with air and then quickly launch, it goes a little farther.

Ethan and Caden

Test

Evaluate your design.

During the design process, did you notice when something wasn't working well and then changed your design to make it work better?

YES NO

Give reasons for any design revisions that you made after testing.

We had to keep tweaking the rocket. We changed the nose cone, launch angle, amount of fins, even the length of the rocket.
The reasoning of changing the launch angle was it was not touching the blackboard (or even the moon) with the current angle. We changed the length of the rocket and made a paper nose cone because we thought it was too heavy to get it to the moon. We changed the amount of fins because we wanted to see if the direction would get better.

Santino and Kai

Test

Evaluate your design.

During the design process, did you notice when something wasn't working well and then changed your design to make it work better?

YES NO

Give reasons for any design revisions that you made after testing.

What made it better was the 4 semi circle fins and the thinner nose cone. This helped make our rocket go farther and towards to moon. But we still didn't make the target. But we did hit the board.

Austin and Cole

Test

Evaluate your design.

During the design process, did you notice when something wasn't working well and then changed your design to make it work better?

YES NO

Give reasons for any design revisions that you made after testing.

We took the clay off the nose cone. The clay was too heavy. Instead we did a paper, small nose cone so it wouldn't be heavy.
We made the fins only one thin piece of paper for each one because they were too heavy also.
We put only a little air in the balloon and we both pushed hard at the same time. When we had a lot of air in the balloon and we pushed there was still room.

Nette and Shane

Test

Evaluate your design.

During the design process, did you notice when something wasn't working well and then changed your design to make it work better?

YES NO

Give reasons for any design revisions that you made after testing.

We ended up changing a lot but we never got the right angle. We took off the fins and made a new nose cone. So it did look different in the end. We changed the angle many many times because at first it was too high then too low. We took off the fins because in the beginning we had no fins then we added them, but they seemed like too much weight. We made a new nose cone because the nose cone was to big and heavy. Plus, everyone else had smaller and pointier nose cones so we decided to change it.

Charlotte and Ace

Improve

List at least 2 ways you can improve your design.

One improvement was making the nose cone lighter so that the rocket could fly the distance of 5 feet and hit the target (moon). Taking the clay off the rocket and then bending the straw using tape secure it down helped make the nose cone lighter.

Another improvement is the number of fins and the position of the fins on the rocket which helps with the direction the rocket flies.

Did your improvements work? **YES** **NO**

Did your rocket hit the target every time? What fraction of the time did your rocket hit the target?

Before my final design change my rocket hit the target 1/15 times. After the final design change the rocket hit the target 4/5 times.

T. Weisenberg

Improve

List at least 2 ways you can improve your design.

We can press on the balloon to help the air escape faster, making the rocket go faster, farther, and higher.

We can cut the bendy part off of the straw to eliminate accidental last-minute flight-path changes.

Did your improvements work? **YES** **NO**

Did your rocket hit the target every time? What fraction of the time did your rocket hit the target?

Our rocket hit the moon 2 out of 21 times. One was 2' 10.5" in the air, and the other time was on the ground at a 70 degree angle.

Ethan and Caden

Improve

List at least 2 ways you can improve your design.

One of our improvements was changing the rocket length by about two and a half inches shorter.

Another one of our improvements was changing the amount of fins from four to two.

Did your improvements work? YES NO

Did your rocket hit the target every time? What fraction of the time did your rocket hit the target?

Our air powered rocket didn't hit the moon every time because it takes time to make the rocket hit the target. We hit the target 2 out of 11 times.

Santino and Kai

Improve

List at least 2 ways you can improve your design.

We are would make the body smaller.

Blow less air in the balloon and each use our hardest force to push down on the balloon.

Did your improvements work? **YES** **NO**

Did your rocket hit the target every time? What fraction of the time did your rocket hit the target?

It never hit the target. The rocket hit the target 0 out of 25 times. We hit the blackboard but it was 11 in. away from the moon.

Austin and Cole

Improve

List at least 2 ways you can improve your design.

We can change the angle so that it is higher than 72 so it can hit the moon. We used the angles 50, 60, 67, 69, and 72.

We put little air in the balloon and pressed hard so that there was NO air left.

Did your improvements work? **YES** **NO**

Did your rocket hit the target every time? What fraction of the time did your rocket hit the target?

Our rocket hit the target once. 1 out of 25 times.

Nette and Shane

Improve

List at least 2 ways you can improve your design.

The nose cone was to big and way to heavy so we had to make a new one. We made it smaller and pointier.

The launch angle being given or even a scale could help us find the right angle.

Did your improvements work? **YES** **NO**

Did your rocket hit the target every time? What fraction of the time did your rocket hit the target?

Our rocket never hit the target. So we hit the target 0/15 times.

Charlotte and Ace

Share

Terriann Weisenberg

What features of your design helped your rocket hit the target?

Two design features of the rocket, nose cone and fins, helped the rocket hit the target (moon). The nose cone was folded at one end of the straw and then secured with tape. The rocket having 2 fins in a specific position helped direct the rocket's flight.

After testing, what changes did your group make to your rocket and launcher? Explain why you made those changes.

During testing, the launcher device itself was changed once due to a hole in the balloon. I changed the amount of breaths blew into the balloon from either 1 or 2 breaths. At first I thought one breath wasn't enough to give the rocket the air needed to fly, so I changed it to 2 breaths. Then, I realized it wasn't that the rocket needed more air-power, it needed a lighter nose cone. Folding down the end (nose cone) of the straw and securing with tape helped keep the weight of the rocket light so that it could fly the distance of 5 feet. After several trials, I decided to go back to 1 breath of air in the balloon so the air could release quicker giving the rocket the power it needed to hit the target. At a 70 degree angle the rocket with 2 fins hit the target once. Changing the position of the 2 fins by angling them upward instead of out to the side helped with the directionality of the rocket making the rocket hit the target 4 times..

How did changing the launch angle affect how your rocket flew?

The launch angle affects the flight path of the rocket, therefore, the angle needed to be changed several times to find the best angle that would hit the target. Launch angles of 60-70 degrees had a more curved path than 35-50 degrees. The launch angle of 45 degrees worked best for my final rocket design.

What's an example of potential (stored) and kinetic (motion) energy? Describe how the energy converts from one form to another.

The air in the balloon is potential energy. When the pressurized air inside the balloon pushes out, the potential energy changes to kinetic energy which makes the rocket move.

Share

Ethan and Caden

What features of your design helped your rocket hit the target?

Some features that helped the rocket hit the moon are 4 fins and height off of the ground.. Another thing that helped was pushing on the balloon to build up air pressure, therefore launching the rocket further.

After testing, what changes did your group make to your rocket and launcher? Explain why you made those changes.

At first, the nose cone was made out of clay. However, that made the rocket unbalanced by weighing the front down. So, we took the clay off and replaced it with rolled a paper nose cone.

How did changing the launch angle affect how your rocket flew?

The higher the angle, the higher and farther on the y axis the rocket goes. However, the lower the angle, the farther across the x axis and lower it goes. If we changed our angle to about 65 degrees, the rocket flew straight and as a line drive. But if you did 85 degrees it would go straight up. We experimented with several angles, and 70 degrees seemed to work the best.

What's an example of potential (stored) and kinetic (motion) energy? Describe how the energy converts from one form to another.

The potential energy was the air inside of the balloon. When we let go, the moving air is kinetic energy making the rocket launch..

Ethan and Caden

Share

Santino and Kai

What features of your design helped your rocket hit the target?

The balloon, when it was barely blown up, helped it go faster and farther. We found out that when the balloon is really blown up, the balloon can't really get out all of the air at once. When the rocket body is cut off about an inch, it reached father, due to not being so heavy.

After testing, what changes did your group make to your rocket and launcher? Explain why you made those changes.

We cut off about an inch of the rocket and made a paper nose cone, so that the rocket wouldn't be so heavy and would go faster and farther. We changed the amount of fins because we wanted to see if the direction would get better. We didn't make any changes to the launcher, since we didn't see any problems with the launcher.

How did changing the launch angle affect how your rocket flew?

One time, we had the rocket fly high up into the air, and come back down. Not even close to the target. So, we had to change the angle a whole lot, so that we can actually hit the target. When we changed it to around 75°, it almost hit the target.

What's an example of potential (stored) and kinetic (motion) energy? Describe how the energy converts from one form to another.

The air in the balloon would be called potential energy, due to the air being stored in the balloon. When the air all comes out into the rocket, that is when the energy converts into kinetic energy, which is the air moving into the rocket, which is when the rocket is forced out, towards where you are aiming.

Share

Austin and Cole

What features of your design helped your rocket hit the target?

Our rocket never hit the moon/ target but I think if we made the body smaller we would of hit the target.

After testing, what changes did your group make to your rocket and launcher? Explain why you made those changes.

We made semi circle fins and a thinner nose cone. We changed from triangle fins to 4 semi circle fins and that made it go farther. The thinner nose cone made it have less weight so it would go farther.

How did changing the launch angle affect how your rocket flew?

When we did launch it, we used 65 degrees. It hit the blackboard but was too short. So we did 80 degrees and it went a little better but higher than the moon.

What's an example of potential (stored) and kinetic (motion) energy? Describe how the energy converts from one form to another.

The potential energy was the air in the balloon. When the air came out of the balloon it was kinetic energy making the rocket fly.

Share

Nette and Shane

What features of your design helped your rocket hit the target?

Putting less air into the balloon, pressing the balloon really hard to launch the rocket, and taking stuff of off the rocket like, tape and clay helped the rocket fly to the target.

After testing, what changes did your group make to your rocket and launcher? Explain why you made those changes.

We changed the angle to higher degrees because the rocket was hitting the black poster board, but not the moon. We also put less air in the balloon so we could push out all the air. We took tape and clay off because it was weighing it down.

How did changing the launch angle affect how your rocket flew?

If the angle was to short it would hit the ground and if the angle was to high it would hit somewhere above the moon.

What's an example of potential (stored) and kinetic (motion) energy? Describe how the energy converts from one form to another.

Potential energy is when the balloon has air in it and the air is staying there. Then when you release the air from the balloon that's kinetic energy.

Share

Charlotte and Ace

What features of your design helped your rocket hit the target?

No fins and less air in the balloon helped us get closer and we hit the black on the target.

After testing, what changes did your group make to your rocket and launcher? Explain why you made those changes.

We got rid of the clay because it was making the rocket too heavy. We also got rid of the fins because they were holding back the power of our rocket. When we put less air in the balloon the rocket went farther.

How did changing the launch angle affect how your rocket flew?

When the angle was too high 70 degrees it hit over the moon. So we made it lower to about 55 degrees and the rocket hit right under the moon.

What's an example of potential (stored) and kinetic (motion) energy? Describe how the energy converts from one form to another.

The air in the balloon was potential energy until it was released, the air then turned into kinetic energy.