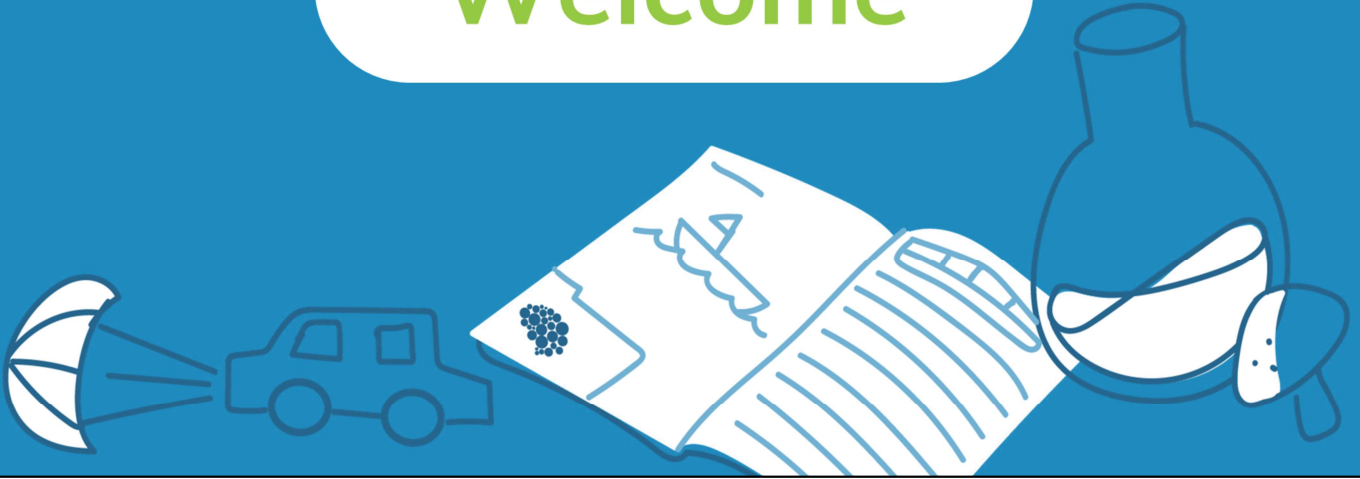


Welcome



What things around you do you find frustrating or not fun to do?

- Clean my room
-
-
-
-
-
-
-
-



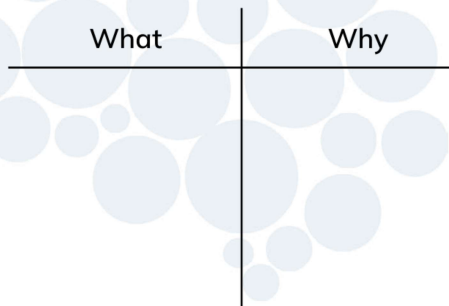
Use this slide to list out the frustrations the group comes up with.

Can anyone share something they know about INNOVATION?



Ask the group if there is something they know about innovation.

Can anyone share something they know about INNOVATION?



What	Why	When	How	Who



To help organize the discussion and encourage the group to see themselves as inventors/innovators, direct the group discussion to fill out the table on slide 4. Some general/possible entries for the five categories are below.

Innovator Profile - Andrea Sreshta & Anna Stork



Photo courtesy of luminAID

ANDREA SRESHTA AND ANNA STORK

From: New York City

Age at time of invention: Early 20's

Invention: An inflatable solar powered lantern that can be used in emergencies or in areas without reliable electricity.



Click on the picture to load the YouTube video
<https://www.youtube.com/watch?v=8RR6shO-FHg>

After the video reflect with the group by having them answer the following things:

- What is the problem that was being solved?
- What is the solution?
- What resources did they use to come up with their solution?

Innovator Profile – Chris Haas



CHRIS HAAS

Age at time of invention: 9 years old

Invention: Hands On basketball is a basketball that shows kids where to put their hands to make a given shot.

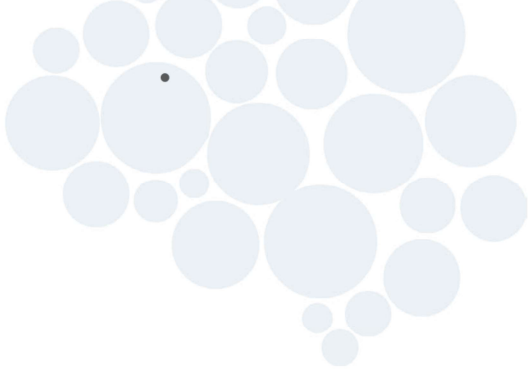


Click on the picture to load the YouTube video -
<https://www.youtube.com/watch?v=Px1v20R7Dgo>

After the video reflect with the group by having them answer the following things:

- What is the problem that was being solved?
- What is the solution?
- What resources did they use to come up with their solution?

What things around you do you find frustrating or not fun to do?



Copy the frustration list from slide 2 to slide 7.

Have the group pick one or two of their frustrations and recast as a challenge that is actionable (it might already be this way, but if not take a couple of minutes to do this).

Example – I hate feeding the dog → The dog's food gets everywhere when he/she eats, and I wish it didn't.

Brainstorming



Ask the group if someone can tell you what brainstorming is – coming up with as many ideas around a challenge or topic or problem as possible. Remind the group that we don't judge ideas as good or bad in brainstorming, we're just trying to come up with as many ideas as possible.

Pick one of the frustrations from the previous page and have the group work on coming up with as many ideas around that frustration as possible.

Plan for the next few days – you become the inventors!

Day 1 (today) – Introduction to invention

Days 2 & 3 – Distribute the *Book of Ideas*, work on your inventions, give feedback to and get feedback from your classmates

Day 4 – Finish up your invention and present your idea to the group



Show students the *Book of Ideas* but don't hand them out yet.

Lightning Round Brainstorming

1. Today in school I had a great idea...
2. We should reuse car tires to make...
3. How cool would it be if we could make electricity from...
4. This could help keep our oceans clean and safe...
5. What if we put solar panels on...
6. I wish we could run airplanes, cars and trucks on...
7. What if we used heat from the Earth to power...
8. What if we used heat from the Earth to power...
9. This would make it easier for people to save energy...
10. I want to make a difference by...
11. We should reuse dishwater and shower water to...
12. What if we could make houses out of...
13. This would make it easier for people and companies to use less water...
14. I want to make a difference by...



On the slide are all the prompts in the Book of Ideas.

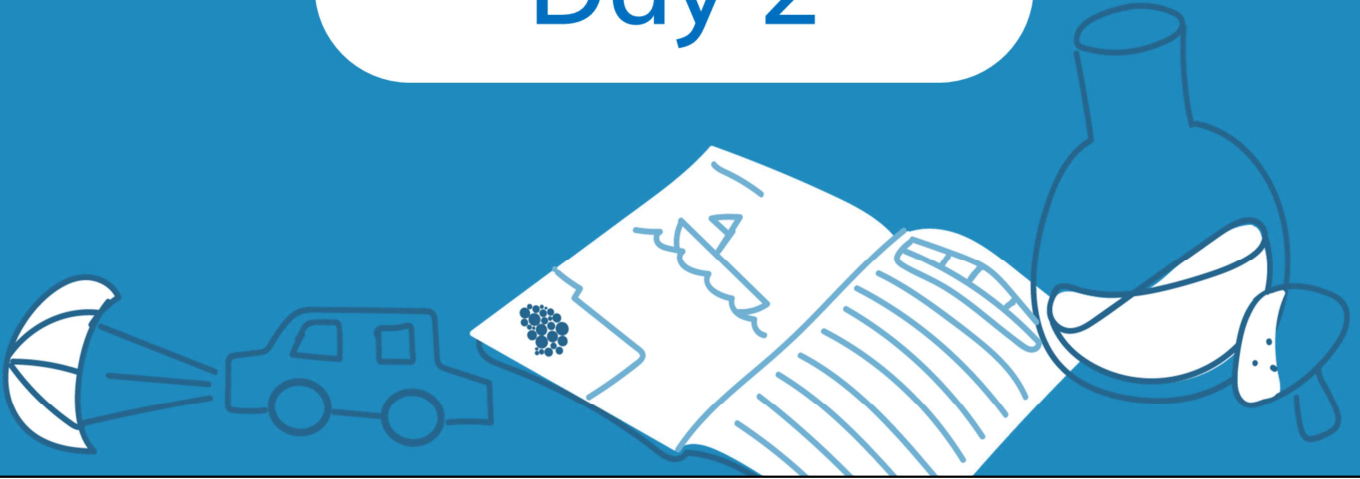
Read through them as a group. While you're doing this handout 1 – 2 pieces of scratch paper to each student.

After you have read through all the prompts, have the students each pick one and spend 2 -3 minutes INDIVIDUALLY brainstorming all the things they can think about to address that prompt or challenge. They should write either the prompt (ideally) or the prompt number (alternative) on the top of their page. Writing down the full prompt will help them keep focused on it as they brainstorm.

After 2 – 3 minutes have the students share out some of their ideas.

Depending on the time remaining, do a repeat session with a new prompt.

Day 2



Plan for the next few days – you become the inventors!

Day 1 – Introduction to invention

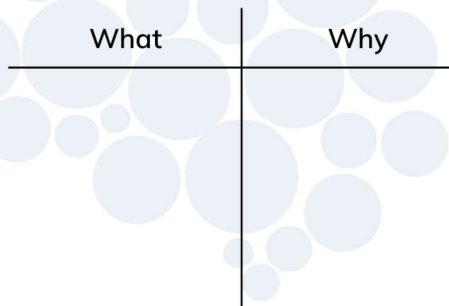
Days 2 (today) & 3 – Distribute the *Book of Ideas*, work on your inventions, give feedback to and get feedback from your classmates

Day 4 – Finish up your invention and present your idea to the group



Remind students of the plan for the week

Can anyone share something they know about Innovation?



What	Why	When	How	Who



Then have a quick (2 – 3 minute) recap discussion about what innovation is.

The Engineering Design Process

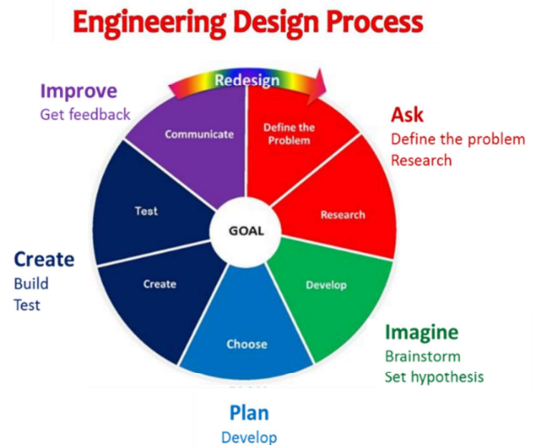
Step 1: Start with a question, problem, or goal.

Step 2: Think about all the possibilities.
(brainstorming)

Step 3: Decide which ideas from step 2 you want to use.

Step 4: Create your first draft/prototype/version.

Step 5: Get feedback and improve your design.



Go over the steps on the slide and point out to the group that the “Engineering Design Process is just a formal (or fancy) title for something they do all the time.

The Engineering Design Process

Engineering Design Process



Writing



Art



You can show them that is similar to processes they use in art or writing – just with science and engineering.

The Engineering Design Process

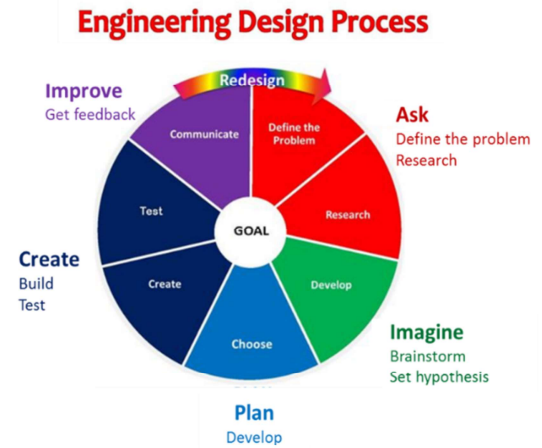
Step 1: Start with a question, problem, or goal.

Step 2: Think about all the possibilities.
(brainstorming)

Step 3: Decide which ideas from step 2 you want to use.

Step 4: Create your first draft/prototype/version.

Step 5: Get feedback and improve your design.



Take a minute to point out the final step in the cycle is feedback – we'll talk a bit more about that later – and that it is a key step in keeping the cycle going.

Innovator Profile – ecoSpears



SERG ALBINO & IAN DOROMAL

From: New York and Florida

Age at time of invention: 20 - 30

Invention: A sponge-filled spear that is able to absorb harmful chemicals out of the mud to clean lakes and rivers.



Click on the picture to load the YouTube video. <https://youtu.be/8I3FVFclvss>

After the video reflect with the group by having them answer the following things:

- What is the problem that was being solved?
- What is the solution?
- What resources did they use to come up with their solution?

Get Inventing!

1. Today in school I had a great idea...
2. We should reuse car tires to make...
3. How cool would it be if we could make electricity from...
4. This could help keep our oceans clean and safe...
5. What if we put solar panels on...
6. I wish we could run airplanes, cars and trucks on...
7. What if we used heat from the Earth to power...
8. What if we used heat from the Earth to power...
9. This would make it easier for people to save energy...
10. I want to make a difference by...
11. We should reuse dishwater and shower water to...
12. What if we could make houses out of...
13. This would make it easier for people and companies to use less water...
14. I want to make a difference by...

Pick one of the 14 challenges in the book and start working on an invention or innovation to address the challenge



Hand out the Book of Ideas have the group start working on individual inventions.

It does NOT need to be the one they worked on before. They should try to work solidly for 15 – 20 minutes. They can switch prompts if they want.

Innovator Profile – Ayla Hutchinson



Ayla Hutchinson

From: New Zealand

Age at time of invention: 13 years old

Invention: Ayla invented the Kindling Cracker after her mother cut herself with an ax while chopping firewood.

[Product Review](#)



Kindling Cracker - <https://www.youtube.com/watch?v=LmEbjC0xY60> - Click on the picture to load the YouTube video

This video isn't the best but it provides enough information to reflect on. You can also check out the product website (<https://www.kindlingcracker.com/blogs/about-ayla>)

After watching the video, reflect on the following questions

- What is the problem that was being solved?
- What is the solution?

YouTube is full of great reviews – which are a good intro to the feedback section. Show a video review (<https://www.youtube.com/watch?v=4-RhakR3Hg8>) and then ask the students:

- What did you notice (often both positive observations/experiences and negative experiences were mentioned).
- How might these reviews be helpful to Ayla (they could help her make changes to improve her product)

Giving and receiving feedback



What is feedback?



To begin with, make sure students know what the word feedback means and when you might get or give it?

Giving and receiving feedback

Feedback is **the HELPFUL information** on things you like or things you think should be changed or modified that you give to someone so they can **improve a performance, product, etc.**



To begin with, make sure students know what the word feedback means and when you might get or give it?

Giving and receiving feedback

What are some things to think about when giving and receiving feedback?



To begin with, make sure students know what the word feedback means and when you might get or give it?

Time and interest permitting, revisit some of the product reviews or product improvements made with the Kindling Cracker (e.g., between version 1 and the XL – which basically got bigger so that larger logs could be used).

Giving and receiving feedback

Useful Phrases for Having Constructive Discussions

Asking Clarifying Questions

Can you be more specific?

Why do you think that happened?

Can you please explain your thinking?

Can you give me another example, so I can understand?

Respectfully Disagreeing with an Idea

Could you explain, because I have a different idea?

I respect your opinion and _____.

I see your reasoning and disagree with some of the idea because _____.

Adding to an Idea

I agree, and I have an addition: _____.

I believe this is true because _____.

Yes, that makes sense, and I would also like to add _____.



Go over the useful phrases with the group.
If possible, hand out a printed list of useful phrases.

Feedback Round 1

Time to test it out.

Find someone working on a **DIFFERENT** innovation prompt.

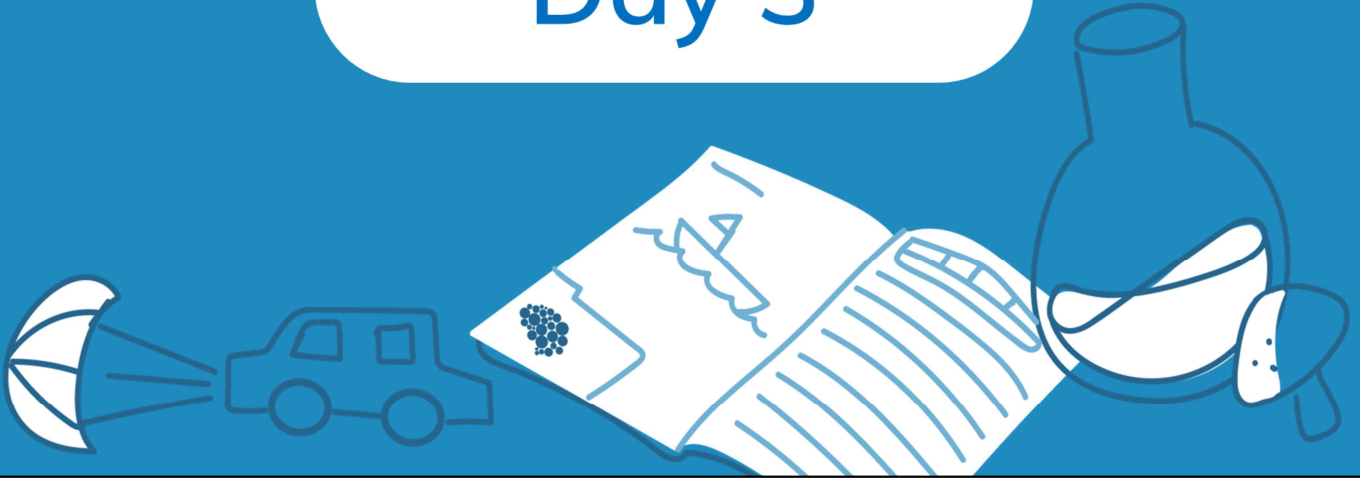


Have the students each find someone with a different innovation prompt.

Have them take turns explaining their innovation and then have the other person give feedback. Encourage everyone to say something nice then also say something constructive using one of the phrases. This should take about 2 – 4 min each person.

After 1 round of feedback, let the students work on their inventions for the rest of the session.

Day 3



Plan for the next few days – you become the inventors!

Day 1 – Introduction to invention

Days 2 & 3 (today) – Distribute the *Book of Ideas*, work on your inventions, give feedback to and get feedback from your classmates

Day 4 – Finish up your invention and present your idea to the group



Remind students of the plan for the week

Innovator Profile – Alex Deans



ALEX DEANS

From: Windsor, Ontario, Canada

Age at time of invention: 13 years old

Invention: The iAid device help people who are blind or have trouble seeing get around more easily.



Go through the innovator profile and then give students 5 - 10 minutes to get reacquainted with their inventions.

If a lot of students want to start in on a new innovation prompt, then give them up to 20 minutes to work on it before the next round of feedback

Click on the picture to load the YouTube video -
<https://youtu.be/EGPo7gnvIhE?si=ZVIUkA7hDrugxPz6>

After the video reflect with the group by having them answer the following things:

- What is the problem that was being solved?
- What is the solution?
- What resources did they use to come up with their solution? How did they incorporate feedback?

Giving and receiving feedback

Feedback is **the HELPFUL information** on things you like or things you think should be changed or modified that you give to someone so they can **improve a performance, product, etc.**



If necessary, Give a quick refresher on feedback.

Giving and receiving feedback

Useful Phrases for Having Constructive Discussions

Asking Clarifying Questions

Can you be more specific?

Why do you think that happened?

Can you please explain your thinking?

Can you give me another example, so I can understand?

Respectfully Disagreeing with an Idea

Could you explain, because I have a different idea?

I respect your opinion and _____.

I see your reasoning and disagree with some of the idea because _____.

Adding to an Idea

I agree, and I have an addition: _____.

I believe this is true because _____.

Yes, that makes sense, and I would also like to add _____.



Remind students of the helpful phrases

Feedback Round 2

Find someone working on the SAME
innovation prompt.



Have the students each find someone with the same innovation prompt (if possible).

Have them take turns explaining their innovation and then have the other person give feedback. Encourage everyone to say something nice then also say something constructive using one of the phrases. This should take about 2 – 4 min each person.

Keep track of the time and then at the end have them go back to working on their innovations.

After 1 round of feedback, let the students work on their inventions for the rest of the session.

Sneak Peek – Next Session Presentation 😊

Hi, My name is _____. Today I will tell you about the _____.
(enter the name of your invention or solution).

Today I'm going to tell you about _____ which
(enter the name of your invention or solution)

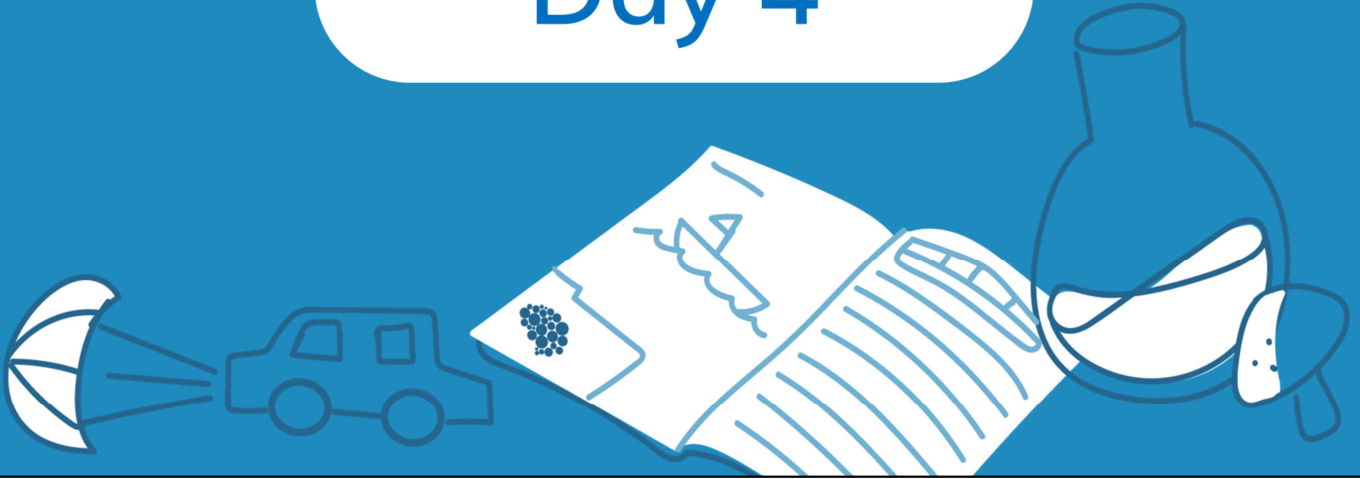
(describe what the invention does in 1 sentence)

The _____ has the following features _____
(enter the name of your invention or solution) (describe your solution in a bit more detail 1- 3 sentences)

Thank you for your time and attention.



Day 4



Plan for the next few days – you become the inventors!

Day 1 – Introduction to invention

Days 2 & 3 – Distribute the *Book of Ideas*, work on your inventions, give feedback to and get feedback from your classmates

Day 4 (today) – Finish up your invention and present your idea to the group



Remind students of the plan for the week

Presentation

Hi, My name is _____. Today I will tell you about the _____.
(enter the name of your invention or solution).

Today I'm going to tell you about _____ which
(enter the name of your invention or solution)

(describe what the invention does in 1 sentence)

The _____ has the following features _____
(enter the name of your invention or solution) (describe your solution in a bit more detail 1- 3 sentences)

Thank you for your time and attention.



Take the next 20 minutes and finish up your inventions and think about what you want to say to the group. If possible, hand out printouts of the script template so that they can fill it out.



Presentations!



