1. **Problem Finding**
(The beginning...)
Identify a problem you would like to solve. You may want brainstorm for problems using different approaches eg thematic, survey or general brainstorming etc.

1A Document a list of problems you have identified. Your documentation should show clearly how your group came up with the problems.

1. We found out cases of phone usage in class. Students are not paying attention in class and they are secretly playing games under their desk using their smartphones. We found this out when we first started going to school when many of our classmates and schoolmates were doing it. The teacher had to stop a lesson just to scold people using phones in class for non-educational purposes.
2. Students lack self control. Whenever the teacher allows students to use their phones for research purposes, students end up using their phones to whatsapp, watch videos etc. We found this out as our teachers had to constantly remind students to not use their phones countless times and even with all the reminders in place, students still do this time and time again.
3. Ineffective measures like keeping phones in plastic bags and cupboards is troublesome. In a technologically advanced world, the usage of phones for learning is required. Teachers who use tech devices to teach will waste time trying to get students to take back their phones if schools use this old fashioned method. Also, some students are stubborn and do not want to pass up their phones and the teacher has to walk around to collect them. We found this out as we realised many teachers use kahoot and google classroom to teach classes as the technology of the world is advancing. If teachers use these methods like keeping the students phones in plastic bags and cupboards, it will not only require much time and effort but will also be ineffective as students will have less time to learn in class.

1B You should have selected a problem based on some considerations. Identify and justify these considerations.

The problem we have selected is about phone usage in students. This is because we believe unrestricted phone usage is the biggest problem to tackle.

1. Using a phone in class will result in students not paying attention. Unfocused learning leads to students not absorbing what the teacher has taught as they are caught up on their games and videos.
2. Lessons would be disrupted when students get caught using phones in class without permission. Constant disruption leads to unhealthy learning environments.
3. Most students are not disciplined enough to have the drive to control themselves, thus requiring teachers or parents to constantly remind them.
4. Habits of addiction to gaming is happening around the world and the cause is because students do not have control with their screen time. Addiction is a number one health problem around the world and it causes not just students, but everybody to suffer from lack of sleep, food etc.. Health problems will thus arise.

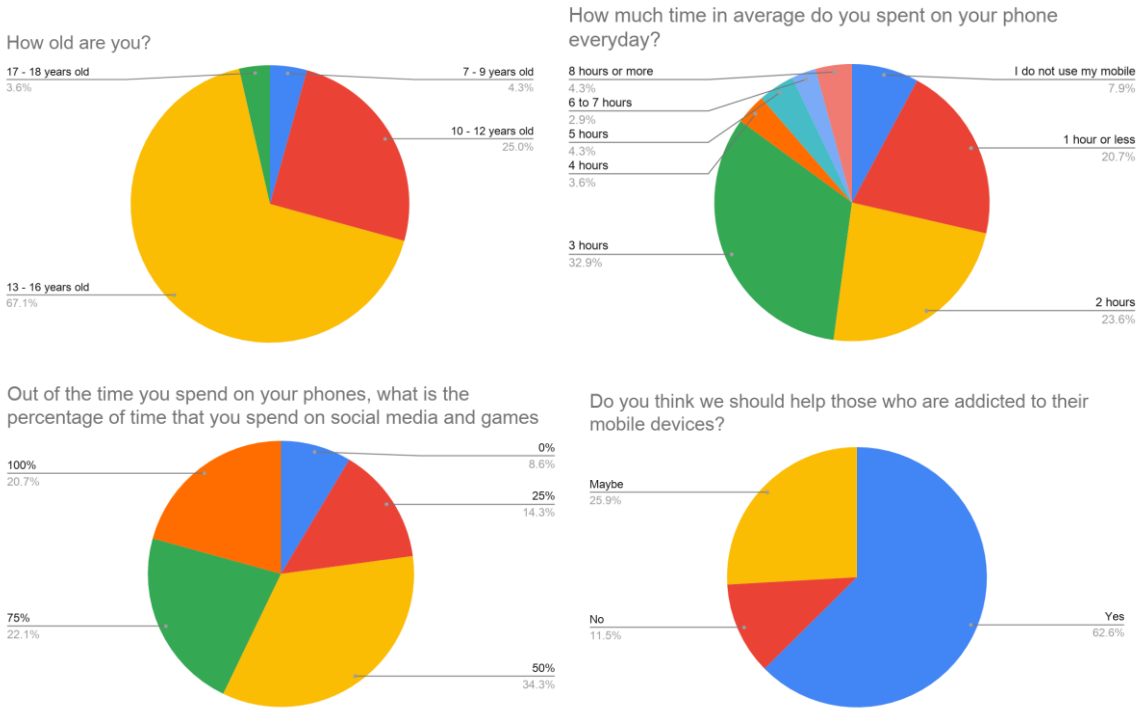
With this in mind, this justifies why we believe phone usage in students to be the priority.

1C List some problems your group would like to solve. List also the considerations for selection of problems in the evaluation grid below. Score the considerations, against the problems, with points 1(least significant) to 4(most significant). Sum up the total points for each problem. Identify the problem you would like to solve.

1. Poor results in students: This is the least significant of all. Results currently are not the main focus. It is indeed a problem, but with the control of phone addiction, gradually the results of students' will improve.
2. Disruption of class time: Students need a healthy learning environment indeed. Without that, students will be affected and will not pay attention in class. Teachers will too be affected as they are unable to finish teaching the required information. This leads to students not being able to learn properly so they would score badly in exams.
3. Lack of self-discipline in students: Discipline is rare among students. Without discipline, there is no control, and without control, phone usage will not be fixed and phone addiction will arise, which is why we need the students to learn how to control themselves and instill a sense of self-discipline in them.
4. Phone addiction: Phone addiction is basically the cause of the list of problems stated above. As long as we tackle phone addiction, these problems will eventually subside.

2. **Define the Problem**
(This is one...)
Now that the problem has been identified. It is important to gather information on the extent of the problem and/or evaluate the usefulness of existing solutions based on some criteria. You may need to conduct surveys and research on existing solutions.

2A Extent of problem (Research and discuss the problem and write down the problem statement)
We conducted a google survey and posted it to students of our school and onto social media platforms for people to complete. This was the easiest and most effective way to collect data. Below is the results of our survey:



2B Compare and contrast the existing or similar solutions.

Putting phones in lockers, plastic bags or cupboards is the most basic and least effective solution. Below are the reasons for our statement:

1. Students are unwilling to surrender their phones. They either sneak their phones or take back their phones secretly after collection.
2. Because of this, teachers cannot rely on using technology to teach students after collecting their phones, making learning to be boring and unexciting. Returning phones back to students is a hassle as students will rush forward to collect their phones, resulting in an orderly manner. Cases of losing phones have happened before.

Using webs or Apps to control screen time on the phone.

1. One example is the screen time usage installed on all Apple phones.
2. Installing apps or built in screen time control in phones is easy to use.
3. However, with kids being so smart this day, they are able to bypass all these restrictions. Also, there are methods to hack screen time displayed all over the web so this proves the ineffectiveness of using webs or apps to control screen time.

The solution we are trying to make is a lot more effective in this cause to prevent phone usage in class and will also help to discipline the students even more. This is said as having the student's phones put right in front of them will urge them to take it or play with it, but they know that there will be severe consequences if done so. In the existing solutions, the phone is out of the student's sight and is far from their reach so they will not have to fight the urge to take it.

3. **Your BIG IDEA***

(Developing the idea.)

Write down your proposed invention and why you want to do it. State also how you think your proposed invention is better.

3A Describe your proposed invention.

Our proposed invention is a compaced box-like figure with a compartment to hold the phone. It contains a raspberry pi circuit board and motion, heat and radiation sensor. Our invention also contains a beaper and LED light to inform the user when the phone is not in place.

3B Explain the purpose of your proposed invention and the potential benefits to users.

The purpose of this invention is to prevent as much phone use in class as possible and curb students' phone addiction.
Students can reduce their addiction to their phones, especially in class. With their phone kept on our invention, teachers can immediately know if there is someone secretly using their phone without the teacher's permission as there will be a sound to notify him/her and a flashing light to allow the teacher to tell exactly which student is using their phone in class so he/she does not need to waste time searching for the student who used his/her phone in class without permission.

3C In what ways would your proposed invention be different and/or better than existing solutions, if any?

The most simple and existing solution is to keep phones is bags, cupboards zip log bags or baskets. As shown in the above questions, this is simple but uneffective. An additional point is about space. These bags, cupboards and bags will take up slightly more space and Teachers need to bring in quite a few bags just to collect all the phones. Using plastic bags is not eco-friendly too. With our invention will reduce the trouble of taking out your phones when they are needed in class, as you can just take it up from our invention. Our invention is also a more environmentally friendly solution as compared to putting phones in zip lock bags.

3DWhat are some problems you expect in the course of your proposed invention? (We are unable to do our project, this are some problems we think we might face if we try to do our invention.)
We expect to face problems like space requirements, lack of time, damage of equipment and cost of equipment.
Firstly, space is an issue. We want to be environmentally friendly as possible and try to use the least number of equipment. We are trying to fit all the equipment in a box. As the measurements are just an average gauge, when we start piecing together the equipment, there might not be enough space to fit all in one box and we may need to compromise.
Next, time is an issue. Our project is risky and requires a lot of time and focus. We need to incorporate IT and technology into our invention, and construct the object physically. We may need to rush if we do not have enough time.
Damage and cost of equipment: We have to keep in mind that cost is an important criteria. Our target is students. There are around 1600 students in HCI. If this project is successful, we need to make sure that the construction of our invention for every student won't be too

costly. We may need to change our equipment and evaluate which equipment to use. If we accidentally damage the equipment while putting together the prototype, we may have to buy again and this might be costly.

3E What and when are the major milestone (project timeline) in your invention?

*Must be able to be constructed based on current / emerging technologies, must not violate the laws of Science or go against the laws of nature.

Nil.

4. **Construction or Modelling Process****
(This first. then that..)
You are now onto the fabrication of your prototype/product. You need to select material and understand how to put them together so that your prototype/product can perform its function.

4A Explain how and why the materials were chosen for the prototype/ product of your invention

N/A

4B Explore these considerations that may guide the construction of your prototype/ product.

N/A

4C Document the prototype/ product development stages. You may use drawings, photographs or videos.

N/A

OR

If construction of the prototype is not possible, then you have to create an animation / as a proof of concept that it can be applied on a bigger scale.

4D Explain why construction of a prototype is not possible and the proof of concept is needed in your case.
The construction of a prototype is not possible as we can't meet up due to the unfortunate COVID-19 situation. The proof is that the government has put up safe distancing measures and our parents also want to keep us safe from getting infected.
Discussion is affected as we require teamwork to build the invention. If we want to build the prototype, only one member can do it because only one person can have all the equipment to built the prototype. Moreover, comments from other group members is hard to understand. They have to present their opinion through using devices and is complicated to understand, compared to speaking verbally to the other person. These problems are the reasons why we are not able to create our invention.
Project work requires team effort and work, and cannot be done solo.

4E Briefly explain how the video / animation can effectively show how your invention will work and the different considerations.

Warning:
Video/ animated simulation only if prototyping is absolutely not possible.
Video/animated simulation must be logical and convincing that the invention works.
Constraints must be clearly included in the logbook or the project wili be heavily penalized

Our poster shows clearly that each part can be put together into the compact cuboid. The poster also explains the problems faced regarding phone addiction and how it is better than previous solutions.