

Concept Generation/Selection

TEAM H

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Overview

- ▶ Initial design ideas with pros/cons
- ▶ Designs that will be pursued further
- ▶ Customer requirements met by designs
- ▶ Updated schedule
- ▶ Updated budget

Project Description

Create a dental triturator that does not require a power source to operate as it will be used in areas where central power is not available. A device that can overcome these challenges is needed in order to help dental students provide improved dental hygiene to those who would not otherwise have access to such.

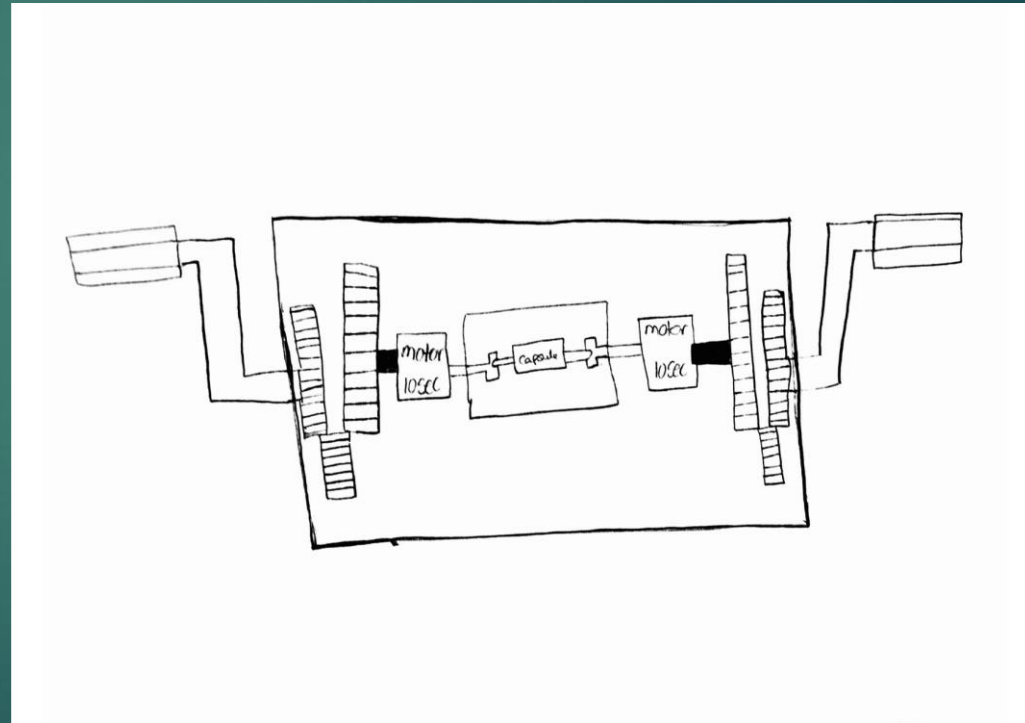
Designs Considered

- ▶ Hand crank + gear box
- ▶ Hand crank + electric motor
- ▶ Compressed air driven piston
- ▶ “Toothbrush” design
- ▶ Rumble motor
- ▶ Spring driven
- ▶ Bicycle driven
- ▶ Jackhammer
- ▶ Fly Wheel

Hand Crank + Gear Box

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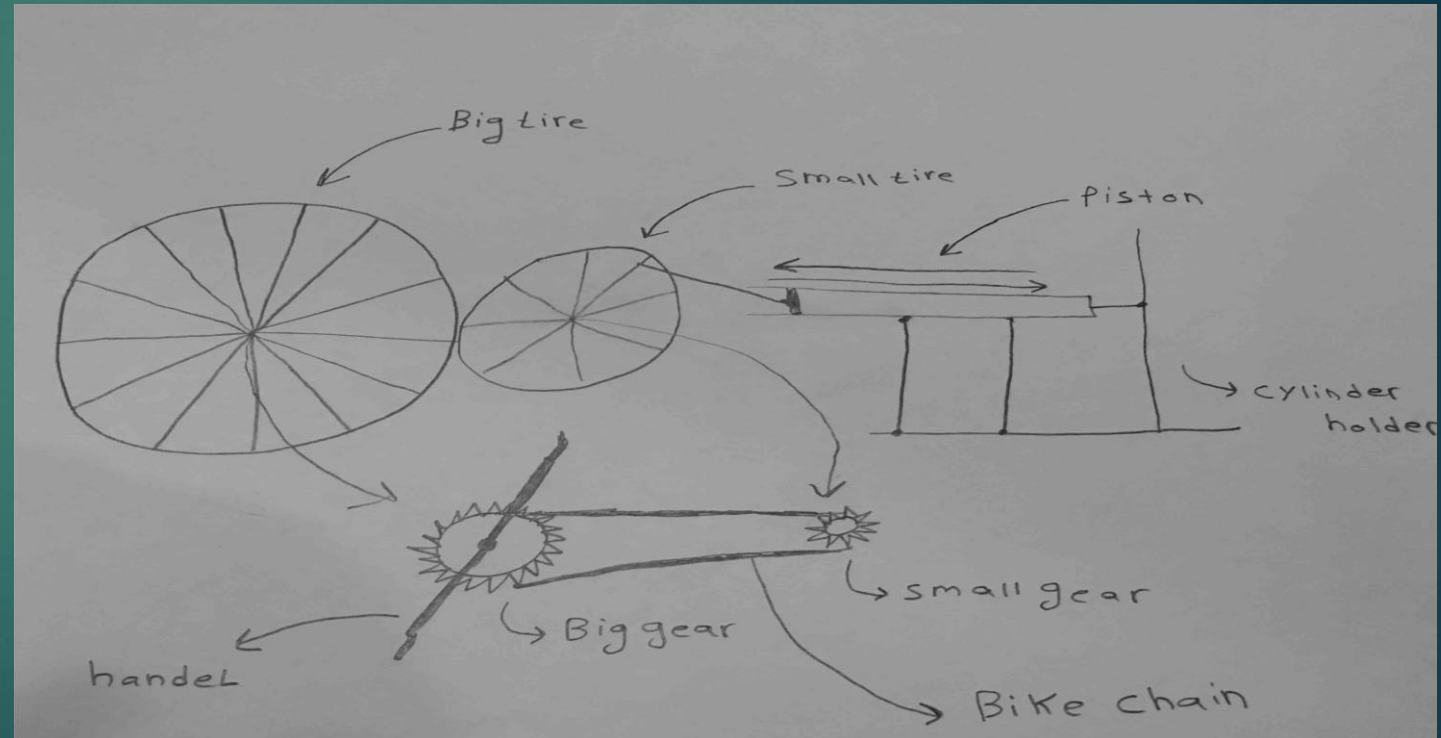
- ▶ Hand crank drives multiplication gear box increasing rpm to required level
- ▶ Requirements met:
 - ▶ Cheap
 - ▶ Easy to use
 - ▶ Human powered
 - ▶ Replaceable parts



Bicycle Driven

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- ▶ Either a bicycle or arm bike produces power to shake capsule
- ▶ Requirements met:
 - ▶ Easy to use
 - ▶ Human powered
 - ▶ Long life span
 - ▶ Replaceable parts



Fly Wheel

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- ▶ A pull chord is used to spin a fly wheel that is attached either a gear box or directly to the capsule, driving the vibration
- ▶ Requirements met:
 - ▶ Easy to use
 - ▶ Cheap
 - ▶ Portable
 - ▶ Lightweight
 - ▶ Replaceable parts
 - ▶ Small



Hand Crank + Electric Motor (Rumble Motor)

- ▶ Hand crank is attached to small generator which directly powers a small electric motor
- ▶ Requirements met:
 - ▶ Easy to use
 - ▶ Small size
 - ▶ Replaceable parts
 - ▶ Shake at constant frequency



Solar Panel

- ▶ A solar panel is used to power any of the electricity-based designs, or to charge a battery for later use
- ▶ Requirements met:
 - ▶ Light weight
 - ▶ Easy to use
 - ▶ Replaceable



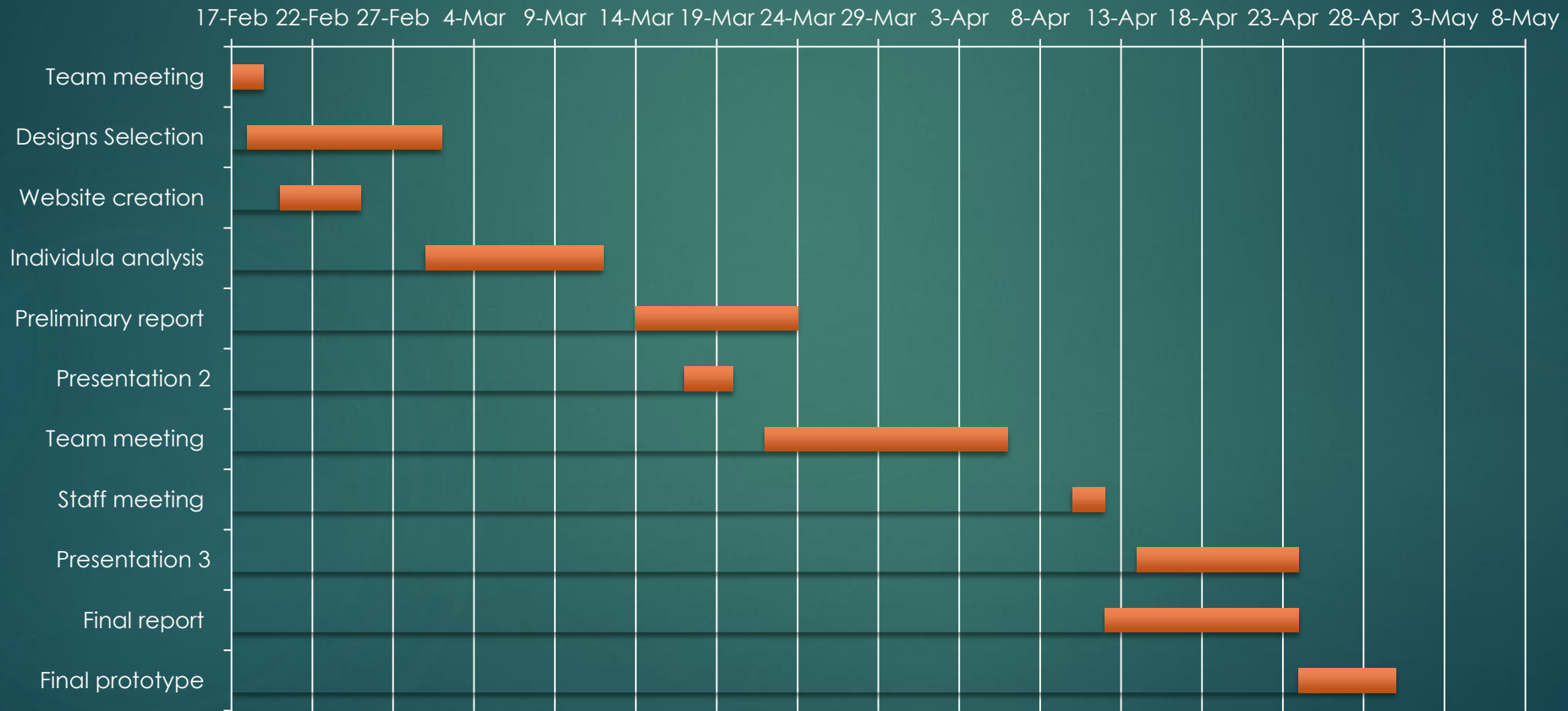
Rechargeable Battery

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- ▶ In any of the designs where electricity is used, a rechargeable battery can be used to store electricity than can be used multiple times before having to be recharged.
- ▶ Requirements met:
 - ▶ Reliable
 - ▶ Easy to use
 - ▶ Replaceable
 - ▶ Long life span



Updated Schedule



Updated Budget

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- ▶ Project total budget - \$ 750
- ▶ Final design cost < \$ 400
- ▶ If Solar Panel is used then final design cost > \$ 400
- ▶ Anticipated expenses :
 - ▶ 3D printing
 - ▶ Material cost
 - ▶ Machining cost
- ▶ Actual expenses : \$ 0
- ▶ Resulting Balance : \$ 750

Summary

- ▶ Initial design ideas with pros/cons
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Questions?