

# Design Thinking & Robotics

Day 2



# What is Cerebral Palsy?

Cerebral palsy is a physical disability that affects movement and posture.

It is the most common physical disability in childhood.

**17 million** people with cerebral palsy worldwide

**34,000** people with cerebral palsy in Australia

You can help advance our knowledge and research into cerebral palsy by joining a Cerebral Palsy Register. Find out more at [cpregister.com](http://cpregister.com)

**1 in 500**

Australian babies is diagnosed with cerebral palsy. There is no known cure.



## MOTOR TYPES

**SPASTIC:** 70-80%.  
Most common form. Muscles appear stiff and tight. Arises from Motor Cortex damage.



**DYSKINETIC:** 6%.  
Characterised by involuntary movements. Arises from Basal Ganglia damage.

**MIXED TYPES:**  
Combination damage.

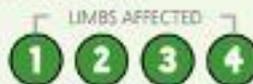
**ATAXIC:** 6%

Characterised by shaky movements. Affects balance and sense of positioning in space. Arises from Cerebellum damage.

## PARTS OF THE BODY

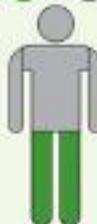
Cerebral palsy can affect different parts of the body

**QUADRIPLEGIA/  
BILATERAL:**



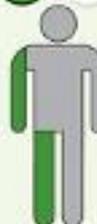
Both arms and legs are affected. The muscles of the

**DIPLEGIA/  
BILATERAL:**



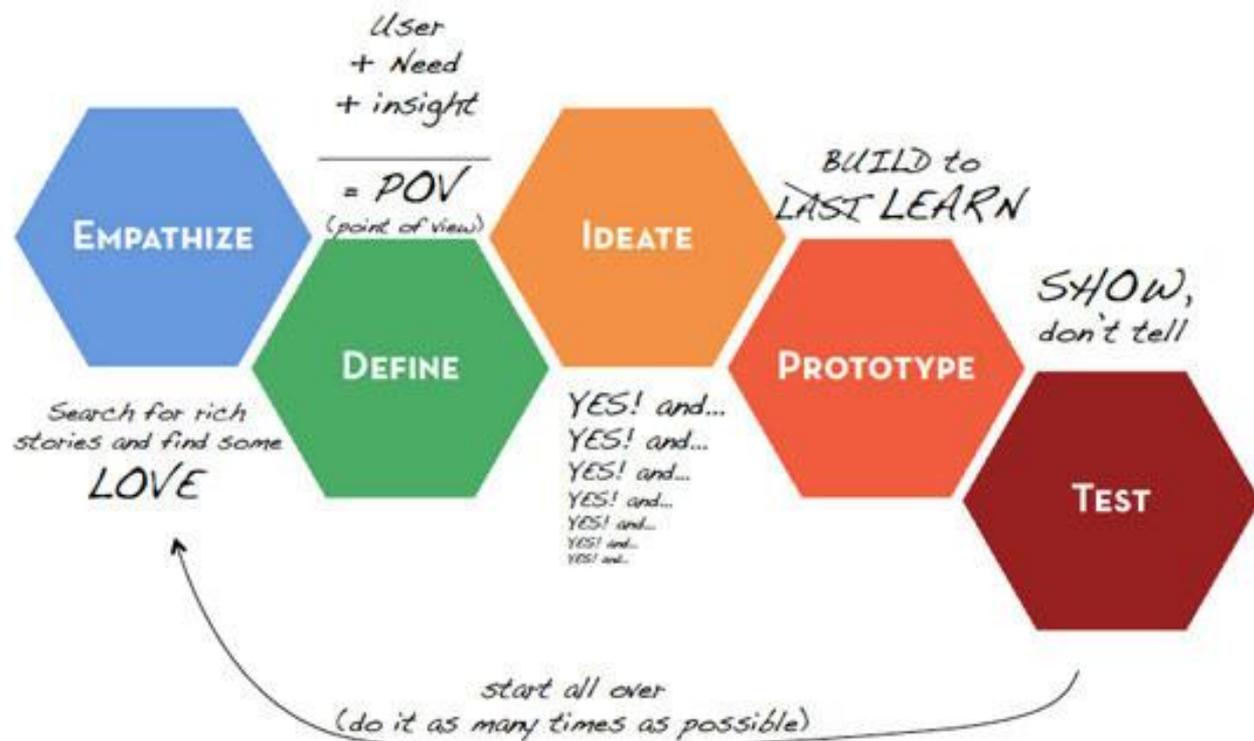
Both legs are affected. The arms may be affected to a

**HEMIPLEGIA/  
UNILATERAL:**



One side of the body (one arm and one leg) is affected

# My design thinking CHEAT SHEET



Wh

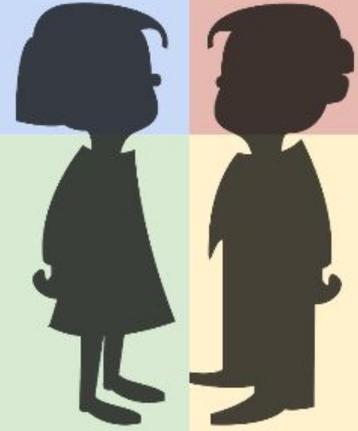
## SAY

What are some quotes and defining words your user said?

# Empathy Map

## THINK

What might your user be thinking? What does this tell you about his or her beliefs?



## DO

What actions and behaviors did you notice?

## FEEL

What emotions might your subject be feeling?

Finally, find Needs and Insights of your user.

Created by @davidleedtech  
Info from IDEO ([goo.gl/uJlQ8K](https://goo.gl/uJlQ8K))

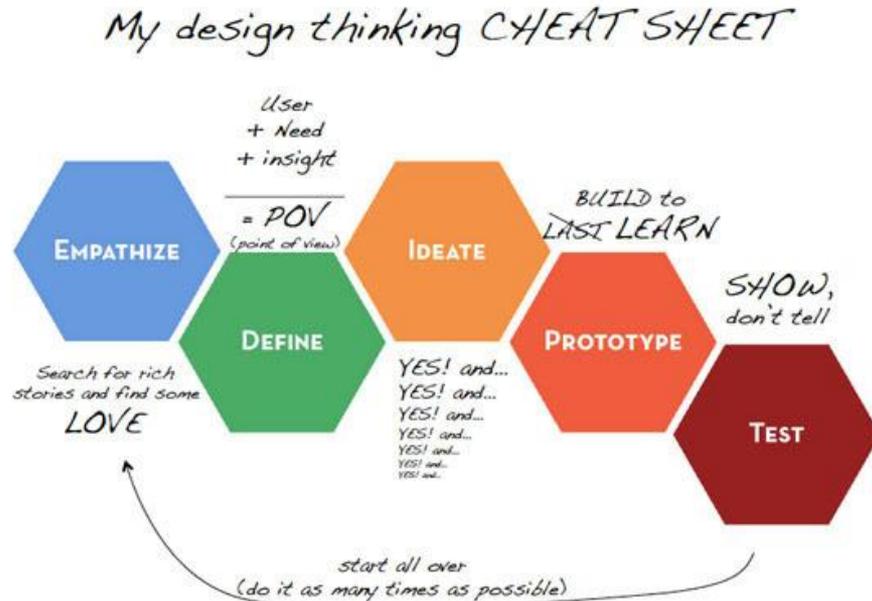
# Empathy Assignment

Within your team, help one member simulate one of the following:

- Simulate tight quadriceps muscles by preventing bending of your knee (i.e. attach a broomstick or yardstick to your leg as a cast)
- Simulate tight calf muscles by preventing bending of your ankle (i.e. create a cast with cardboard, bandages, etc.)

Wear the device for ten minutes, trying out everyday tasks that one would typically do in school, eg. walk to class, get books from lockers, sit at desks, etc. **Ensure that your team member remains safe at all times!** Sit down with your team member before they remove the device and interview them about what they experienced

# Defining the Problem



# What Is a Need Statement?

A concise statement that describes a problem, the population affected, and the desired outcome

- Ex. A method for decreasing the risk of concussion for children in high impact sports

Ensure that the need statement does not focus on a specific solution.

# Meet Tommy

Tommy is an 12 year old boy with level III spastic diplegic cerebral palsy. He is able to walk using braces and crutches. For long distances, however, he prefers to use his wheelchair since walking is an extremely strenuous activity for him. At school, Tommy uses his crutches. However, the chair and desk legs often cause him to stumble in the classroom. Additionally, while he tries to keep his crutches out of the way in the classroom, they often fall or cause somebody else to trip, disrupting the class. Tommy loves acting and wants to audition for the school play. Tommy also loves basketball and wants to be able to play pick-up games

# Generate Need Statements

- Silently, each team member generates 3 need statements
- One statement per sticky note
- Discuss your need statements with team
- Prioritize need statements
- Pick one need statement to work on for the rest of the project