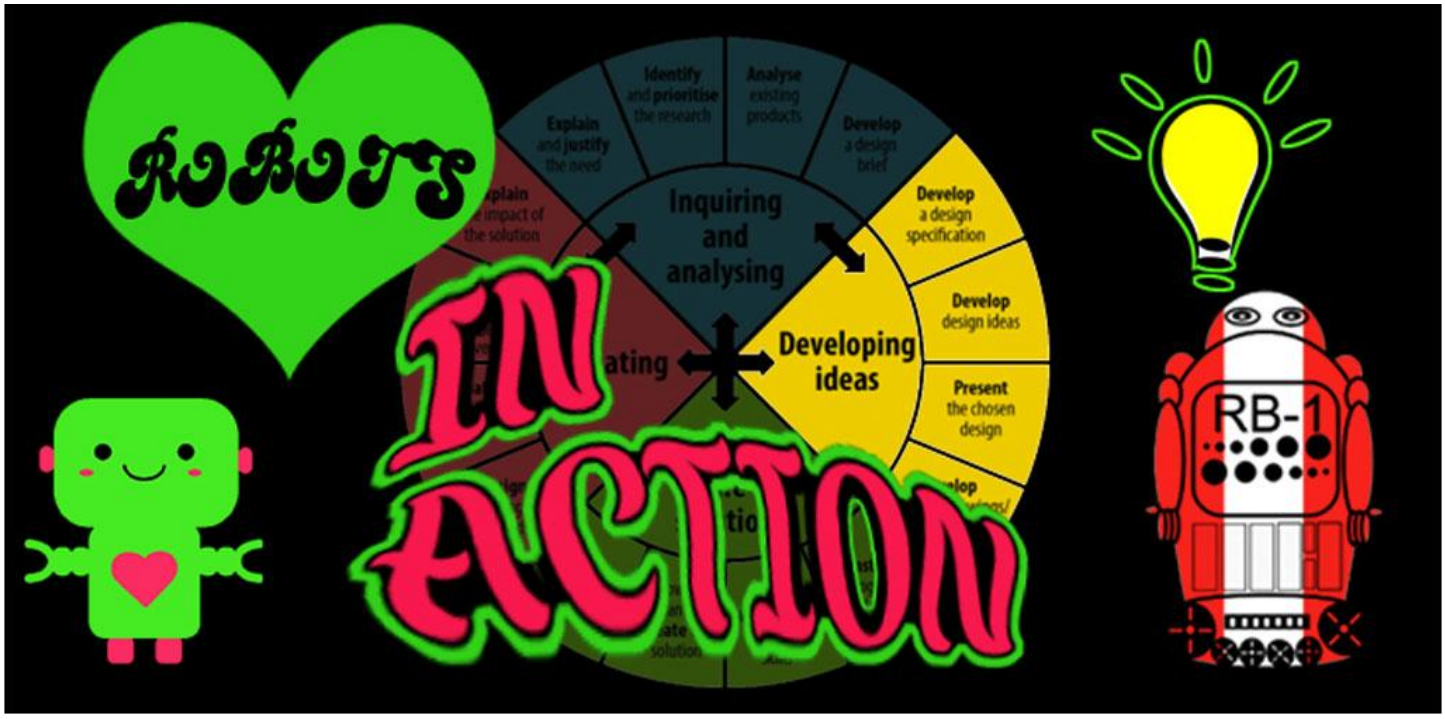
Robots in Action

Criterion B - Developing Ideas

Students establish detailed design specifications that drive the development of a solution.



B.1 - Develop Design Ideas

Develop a wide range of design ideas which can be correctly interpreted by others.

B.1.1 - **Greatest Inspiration**
Which actual robot, other technology, or person has inspired your current best robot idea to meet the goal in the GRASPS? Explain in 2 to 3 sentences.

Types of Robots: Meet Miko (1:34) | Robotic Spy Puppy (1:39) | Nadine (2:06) | Nao Robot (4:55) | Disaster Response (3:10) | Atlas (2:41)

B.1.2 - **2D Idea Sketch**
Insert one 2D pencil sketch of your most developed robot prototype idea.

- Label the colors of the major parts using Cultura Chicha colors. DO NOT COLOR the sketch.
- Label two to three major parts that relate to the robot's primary function.

B.1.3 - **Robot Name** What could be the name of your current best robot prototype idea? Keep it short and relevant.

B.2 - Develop Design Specifications

Develop design specifications which clearly state the success criteria for the design of a solution.

B.2.1 - Robot Design Specifications
Write design specifications for both the robot prototype and the actual robot. The more specific and measurable the specifications, the better you will be able to judge the success of your design.

Use the GRASPS for help. A few categories are finished for guidance.

Category	Description/Questions	Design Specifications
Customer - Location	In which neighborhood of Lima shall the actual robot perform its tasks?	
Customer - People	Who specifically shall the actual robot help? Identify the person or group. Examples: a student, an elderly community member, a family, a class of elementary students, an entire neighborhood, etc.	
Function - General Performance	What shall be the primary function/purpose of the actual robot? How shall it help? Identify one or two areas.	
Function - Empathy Focus	Through which area(s) of empathy shall the actual robot function? How shall the actual robot show and practice empathy?	
Function - Product Safety	What safety requirement(s) shall the actualChoose one or two: 1. Perspective taking - see the world as others see it 2. Non-judgemental responses/actions 3. Recognizes emotions in humans 4. Communicates understandings of people's feelings View Brené Brown on Empathy (2:53) for help. robot follow while performing its	

	tasks? View The Three Laws of Robotics (0:45) for help.	
Aesthetics - Colors	What shall be the robot's exterior colors to connect to Peru's Cultura Chicha meaningfully? Specify three to six colors.	
Aesthetics - Humanoid Look	Which three to six Tinkercad basic shapes shall be used to create the robot prototype to look humanoid? Avoid pre-made shapes under "Creatures & Characters" in Tinkercad.	
Cost - Materials	What shall be the material cost of the actual robot?	Lima, Peru shall pay for the material costs.
Manufacturing - Software	What software shall create the robot prototype?	The robot prototype shall be created with Tinkercad.
Size Requirements (robot prototype)	What shall be the robot prototype's width, depth, and height measurements in mm? Get visual help for width, depth, and height.	The robot prototype shall measure: 40 to 75 mm in width 40 to 75 mm in depth 90 to 150 mm in height
Size Requirements (actual robot)	What shall be the actual robot's width, depth, and height measurements in cm?	The actual robot shall measure: ___ to ___ cm in width ___ to ___ cm in depth ___ to ___ cm in height Delete the blanks and enter whole numbers.

B.2.2 - Presentation Design Specifications
Complete the design specifications for your presentation. Reference the Google Slides template for help. Use screenshots of your robot in Tinkercad as much as possible. Follow the C.R.A.P. Model for visual design guidance.

Category	Description/Questions	Design Specifications
Colors	What shall be the colors used in the presentation?	The background shall be black. The text and visual elements shall be Cultura Chicha colors.
Title Fonts	What shall be the title fonts used in the presentation? The title fonts shall be in the script style of	

	Cultura Chicha.	
Body Fonts	What shall be the body fonts used in the presentation?	
Slide 1 - Title	What shall be the title of the slide? What will be the body text? What image(s) shall appear on this title slide?	Title Text: Body Text: None Image(s): 3D image of my robot in Tinkercad (no grid). The front, side, and top shall be visible.
Slide 2 - Lima Neighborhood	What shall be the title of the Lima Neighborhood Slide? What shall be the body text? What image(s) shall appear on this slide? The body text briefly describes the Lima neighborhood where the robot will serve.	Title Text: Body Text: Image(s):
Slide 3 - The People Served	What shall be the title of the People Served Slide? What shall be the body text? What image(s) shall appear on this slide? The body text briefly describes the group of people the robot serves.	Title Text: Body Text: Image(s):
Slide 4 - Robot Colors	What shall be the title of the Robot Colors Slide? What shall be the body text? What image(s) shall appear on this slide? The body text lists three to six Cultura Chicha robot colors.	Title Text: Body Text: Image(s):
Slide 5 - Robot Development	What shall be the title of the Robot Development Slide? What shall be the body text? What image(s) shall appear on this slide?	Title Text: Body Text: None Image(s): There shall be two images - a robot sketch from Criterion B and a robot screenshot from TinkerCAD.
Slide 6 - Robot Purpose	What shall be the title of the Robot Purpose Slide? What shall be the body text? What image(s) shall	Title Text: Body Text:

	appear on this slide? The body text briefly describes the robot's purpose. This slide may repeat some of Slide 3 - The People Served.	Image(s):
Slide 7 - General Technical Details	What shall be the title of the General Technical Details Slide? What shall be the body text? What image(s) shall appear on this slide?	Title Text: Body Text: There shall be three to four technical labels. Image(s): There shall be one to two robot images from Tinkercad.
Slide 8 - Cultura Chicha Robot Promotion Poster	What text, media, and colors shall make up the Cultura Chicha Robot Promotion Poster Slide? Create a Cultura Chicha poster in: - Google Draw - Photoshop or another graphics program.	
Slide 9 - Brief Summary of Robot	What shall be the title of the Brief Summary of Robot Slide? What shall be the body text? What image(s) shall appear on this slide?	Title Text: Body Text: Image(s):

B.3 - Present the Chosen Design

Present the final chosen design and justify its selection.

B.3.1 - Evaluate your current best robot prototype idea against the design specifications in B.2.1. Use the terms ***YES***, ***NO***, or ***NA*** to estimate if your idea meets the specification. Add the number of ***YES*** responses and show the sum at the bottom. Briefly explain your thinking in the blank sections in column three.

YES - Yes, my robot idea will probably meet the specification.
NO - No, my robot idea will probably not meet the specification.
NA - I'm unsure if my robot idea meets the specification.

Design Specifications	**Yes, No, or NA?**	**Yes, No, or NA? Explain Why.** Add 1 to 2 sentences in the blank sections.
Customer - Location (actual robot)		

Customer - People (actual robot)		
Function - General Performance (actual robot)		
Function - Empathy Focus (actual robot)		
Function - Product Safety (actual robot)		
Aesthetics - Colors (actual and prototype robot)		
Aesthetics - Humanoid Look (robot prototype)		
Cost - Materials (actual robot)		
Manufacturing - Software (robot prototype)		
Size Requirements (robot prototype)		
Size Requirements (actual robot)		
Total # of *YES* Responses ---> (Maximum is 11)		

B.4 - Develop Planning and Drawing Diagrams

Develop accurate and detailed planning drawings/diagrams and outline the requirements for the creation of the chosen solution.

Pencil Sketches for Tinkercad Sketch with pencil your best current idea for an actual robot design using basic shapes. Try to follow your design specifications. Insert photographs of your sketches.
B.4.1 - Top View (2D)
B.4.2 - Best Side View (2D) [show the side with the most details]

B.4.3 - Front View (2D)
B.4.4 - Isometric View (3D) [show three surfaces)]