

Ethics in Engineering



AT LAST! AT LAST! A Perfectly Reliable Acoustic Telephone.



A TELEPHONE THAT WILL WORK WELL OVER ANY ROUTE, REGARDLESS OF ANGLES.
A TELEPHONE THAT WILL WORK WELL IN ALL KINDS OF WEATHER, WIND OR RAIN.
A TELEPHONE THAT DOES NOT ROAR WHEN THE WIND BLOWS.
A TELEPHONE THAT WILL ADMIT OF SEVERAL INSTRUMENTS UPON THE SAME TRUNK LINE.

An Acoustic Telephone Central Office,

Adapted to switch one line with another, similar in effect to the electric system. This is attained by the SHAYER SYSTEM, and its practical utility demonstrated by its use by over 150 bona fide subscribers in New York City, who are paying rentals of \$2 to \$8 per month for the service.

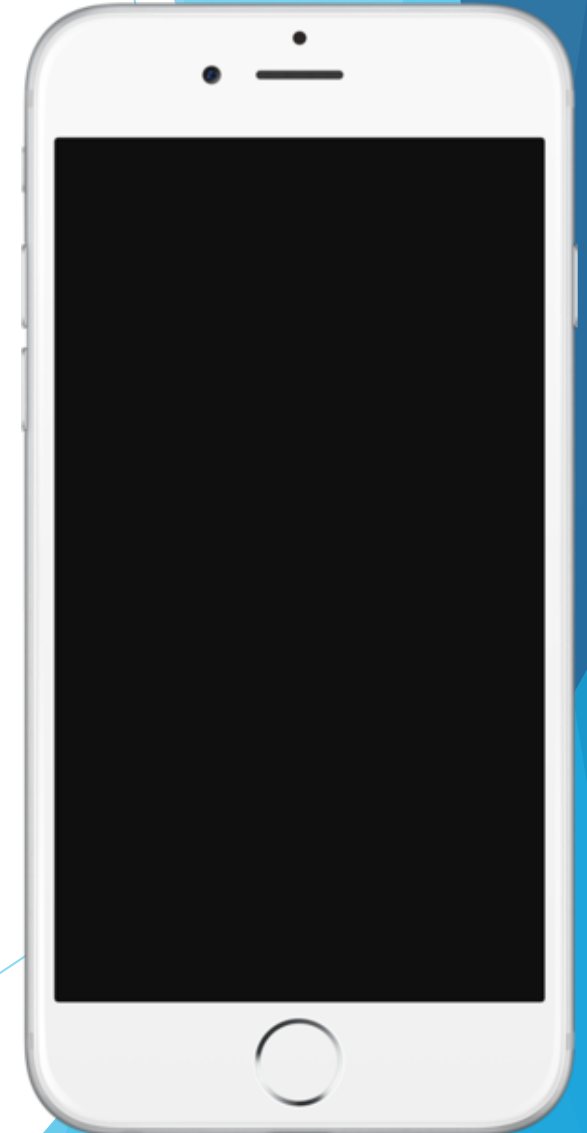
TELEPHONES sold outright or rented in unoccupied territory. Send stamp for list of users and testimonials. It will pay you to investigate the truth of these statements, and secure an agency. Liberal discounts to agents, and satisfaction guaranteed or money returned. References.

To rapidly introduce our goods, we will, for the first time in any town, give a discount of sixty per cent. from our regular retail prices for Telephones, as given below, providing the purchaser will endeavor to secure us a reliable agent.

Retail prices Telephones each.....	\$10.00
Magneto Call Bells (not necessary).....	6.00
Wire per 100 feet.....	.25
Hangers for right angles.....	.25
Ordinary supports.....	.10

The SHAYER SYSTEM of Telephony has been in use by many business houses in this city for the past two years, gives universal satisfaction, and we cheerfully recommend it to those desiring such service. —FRANK LESLIE'S PUBLISHING HOUSE.

THE CONSOLIDATED TELEPHONE CO.,
Jersey City, N. J.

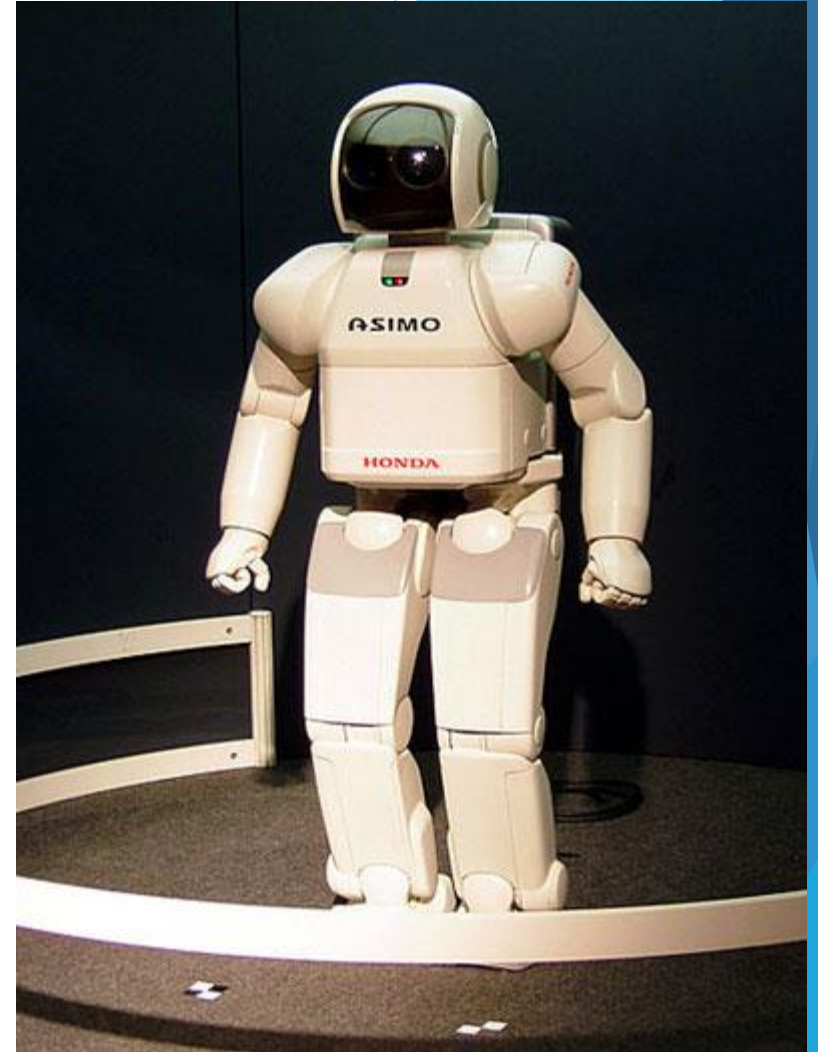


Day 1 Goals

- ▶ Exploring new innovations
- ▶ Evaluating designs
- ▶ Identifying intended demographics
- ▶ **Defining “ethics”**
- ▶ Considering the impacts of testing

Group and Label Activity

- ▶ *Time* magazine publishes a list of the “**Best Inventions of the Year**”
- ▶ Printouts of these inventions are on your desks
- ▶ Working in small teams, sort the inventions into groups. Then **label each group** with a sticky note.
- ▶ *Possible criteria:* location, funding source, creator, purpose, materials, audience or other characteristics of your own choosing
- ▶ Examples:
 - ▶ digital/non-digital
 - ▶ needs/wants



ASIMO (Advanced Step in Innovative Mobility) is a humanoid robot developed by Honda to work as a mobile assistant.

Think/Pair/Share

- ▶ Imagine you are editors at [Time Magazine](#).
- ▶ You must identify one invention as the *best invention of the year* and one as the *runner up*.
- ▶ The winning inventions must be from the 16 inventions in your pile.
- ▶ With your partner, discuss:
 - ▶ Which is the **best invention** and why?
 - ▶ Which is the **runner up** and why?

And the award goes to....

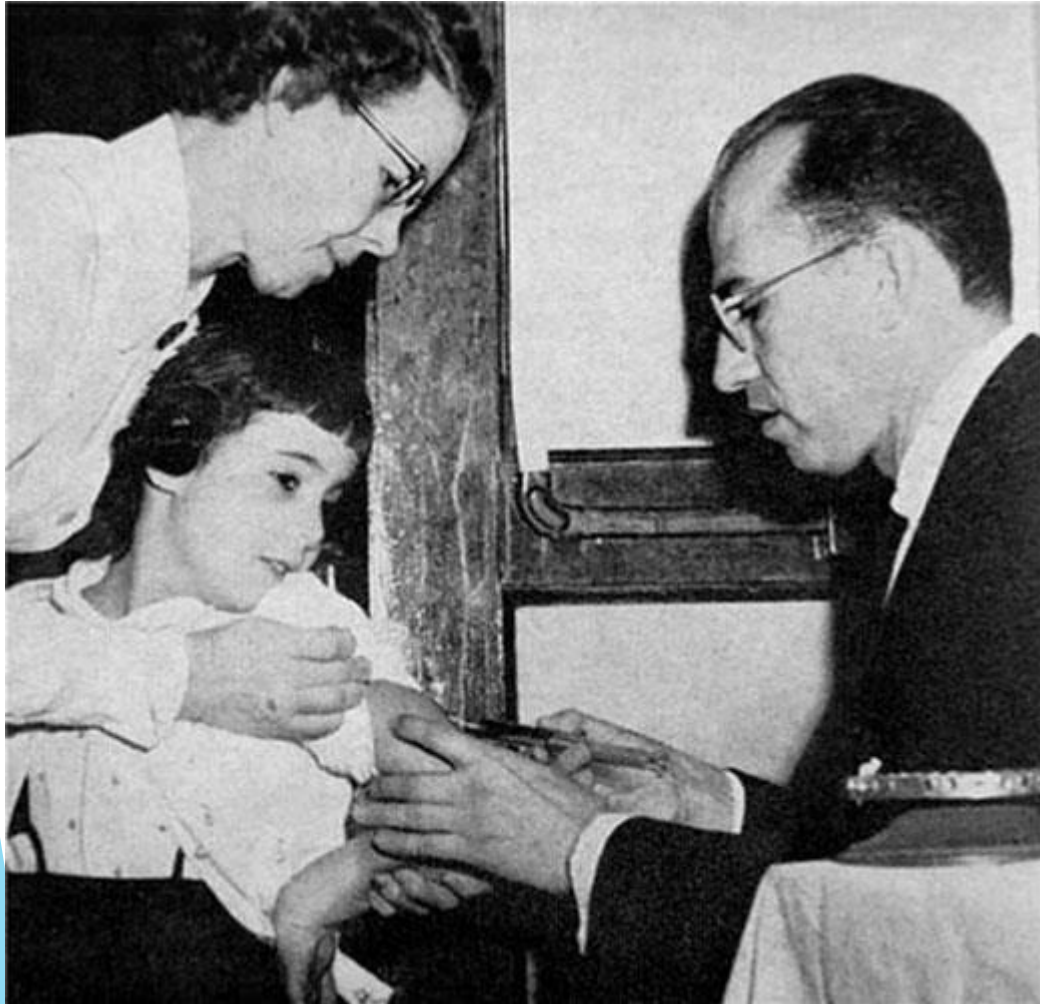
- ▶ You have two stickers.
- ▶ Place them on the **2 inventions** that you think are the most deserving of recognition.
- ▶ Do this activity individually.



Analysis: About Your Choices...

- ▶ Which 2 inventions received the most stickers?
- ▶ If you voted for them, why did you feel they were most deserving?
- ▶ Does anyone feel a different invention would have been more deserving?
- ▶ Who will those inventions help?
- ▶ Who can afford to use them?
- ▶ Which 2 inventions got the fewest stickers?
- ▶ Why didn't more people vote for them?

Engineers Make a World of Difference



For whom does engineering make the world a better place?

In what ways does engineering make a difference?

Jonas Salk's polio vaccine saved hundreds of thousands of people around the world from paralysis.

Analyze Two Designs

- ▶ In your small groups, identify the **top 2 designs**
- ▶ Then answer the worksheet questions about those inventions



On the following slides, example answers are provided for analyzing the disposable pill packets →

Example Answers

for the disposable pill packets

1. Who does this design benefit?
In what ways?

This design benefits people who are chronically ill or their caregivers. It helps them keep track of medications. It is for people who can afford multiple medications and/or who have the insurance coverage for multiple medications.

2. Who or what might be harmed by this design? In what ways?

The environment might be harmed if the materials are not easily degradable.



A new study estimates that 8 million metric tons of trash—the midpoint of the researchers' estimate—enters the ocean from land each year. That's equivalent to about 1.5 million cars.

Example Answers (continued)

for the disposable pill packets

3. Who might be discouraged or excluded from using this design?

This design is not for people who cannot read or who are cognitively impaired. It is probably not for people in countries who do not have access to medicines.

4. Who funded the development of this design, and why do you think they funded it?

A pharmacy funded this design, perhaps so people would order drugs from their pharmacy.

5. After looking more critically at this design, is there anything else you noticed?

How do people with vision problems read this design?

The Engineering Code of Ethics

- ▶ Review the engineering code of ethics at:
<http://www.nspe.org/resources/ethics/code-ethics>
- ▶ Create a class definition of “ethics.”
 - ▶ To do this, decide on the **five principles** you believe are the most important.
 - ▶ Keep these five principles in mind as we progress through the activity.

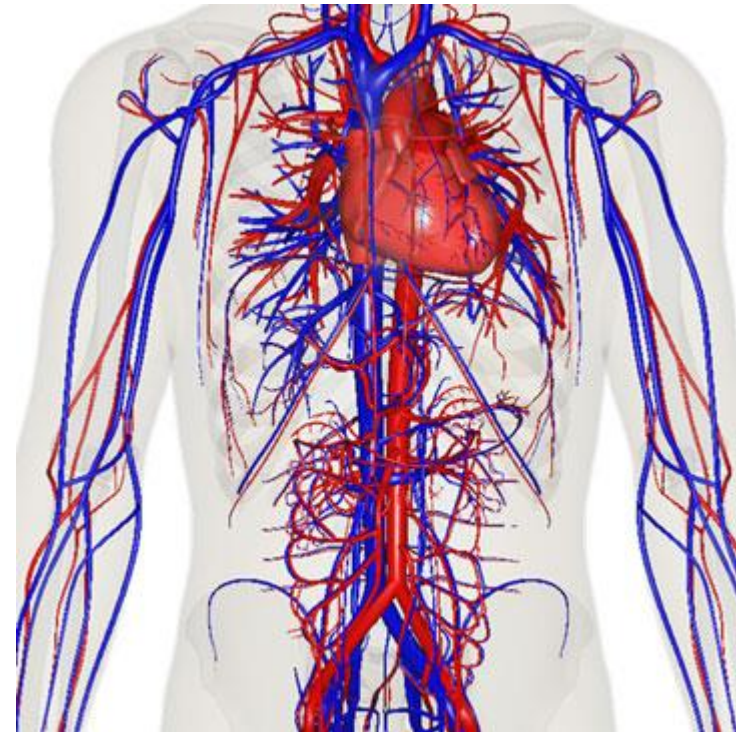
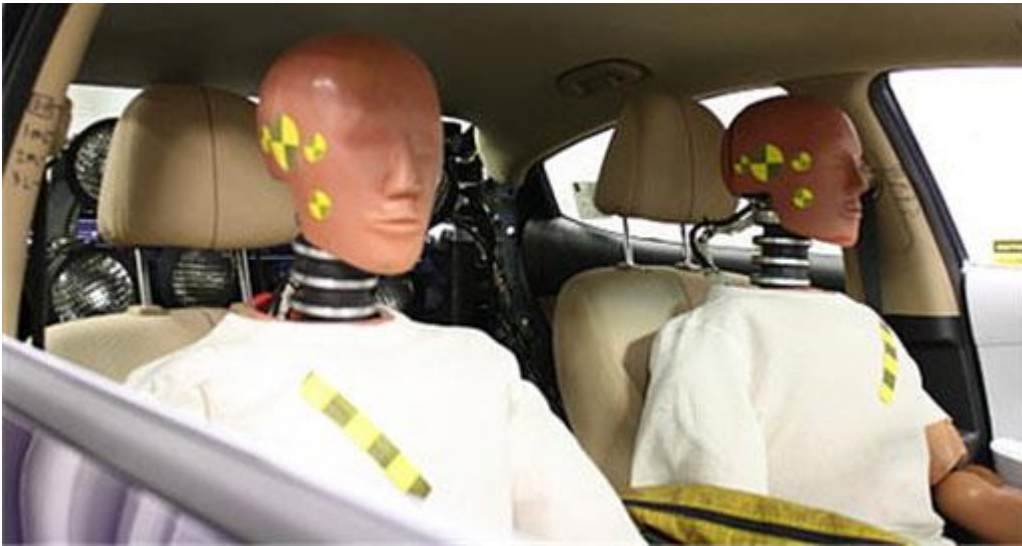
Who is the product tested on?

HEALTH

176 CO

Labs Are Told to Start Including a Neglected Variable: Females

By RONI CARYN RABIN MAY 14, 2014

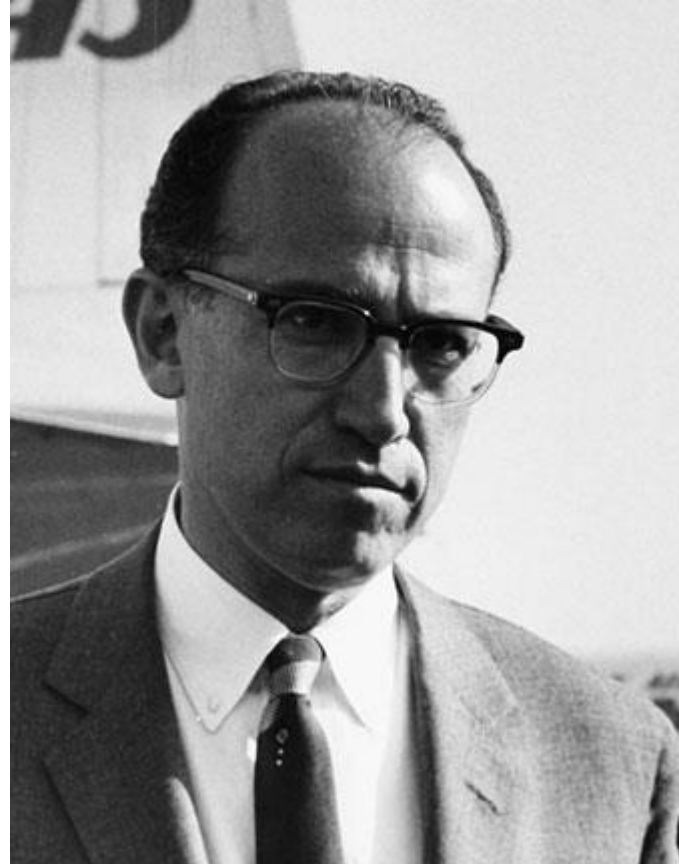


Historically, women have been under-represented in product and safety testing, which has led to dangerous confusion when it comes to automotive safety and medication dosage.

Who is the product tested on?



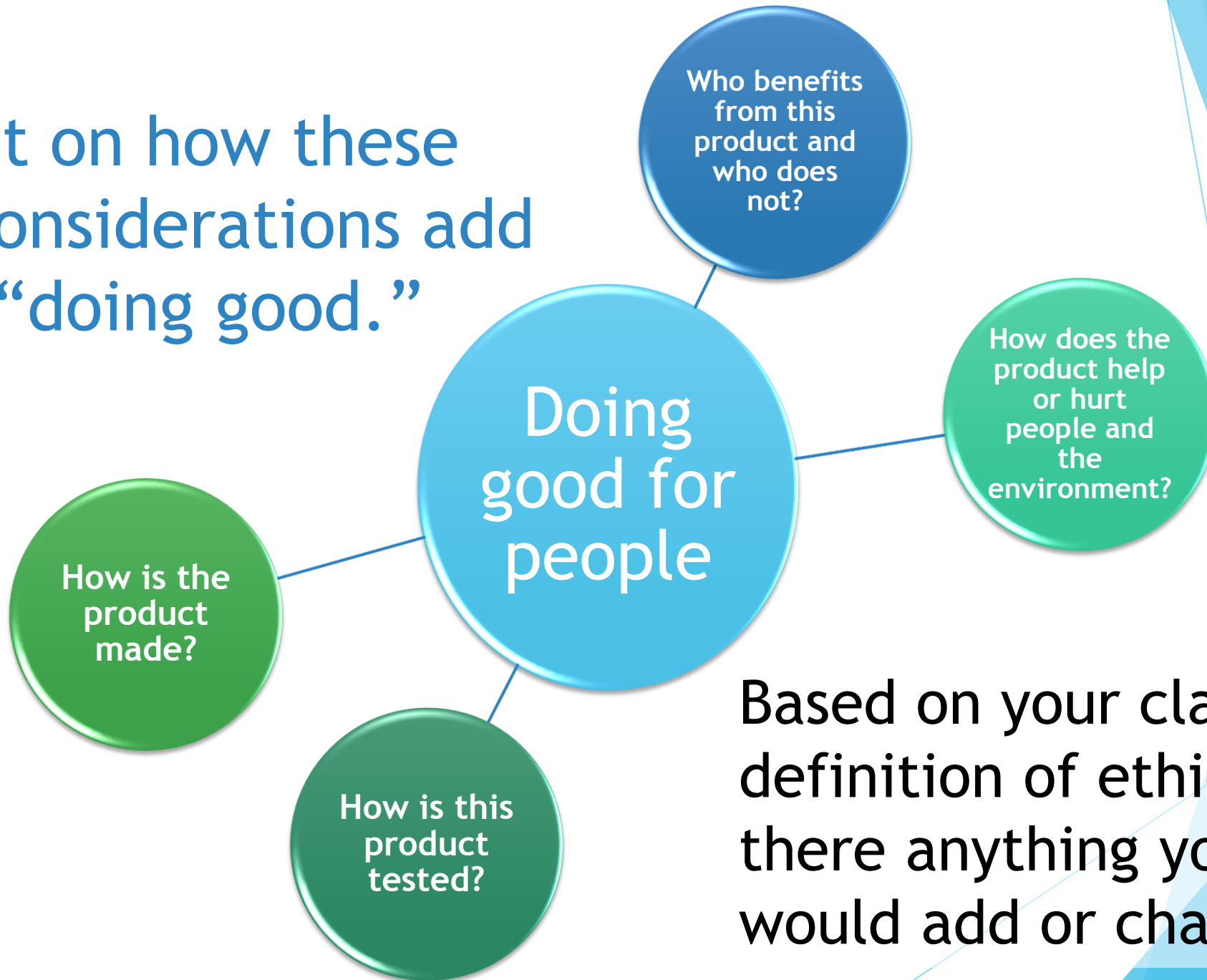
Josef Mengele conducted painful and deadly medical experiments on WW2 concentration camp prisoners.



Jonas Salk deliberately infected mental hospital patients with influenza.

Do the benefits of the research outweigh the rights of the subjects?

Reflect on how these four considerations add up to “doing good.”



Based on your class definition of ethics, is there anything you would add or change?

Critical and Ethical Thinking in Engineering

- ▶ Read article about the Odón Device:
“Car Mechanic Dreams up a Tool to Ease Births”
- ▶ As you read the article, fill in the graphic organizer on the worksheet with at least 5 questions about the article.
 - ▶ *Question topics:* manufacturing, testing, availability, impact, another topic of your choice

Example Questions

Testing: Why was the Hemopurifier only tested on a person in Germany and not on people in Africa?

Manufacturing: How much does the hemopurifier cost to make. How much is it sold for?

Availability: What kinds of medical facilities are needed for this design to work? How many hospitals around the world have dialysis machines?



To help you formulate your questions, here are a few example questions about a different device — the Hemopurifier, a blood filter that fights Ebola.