

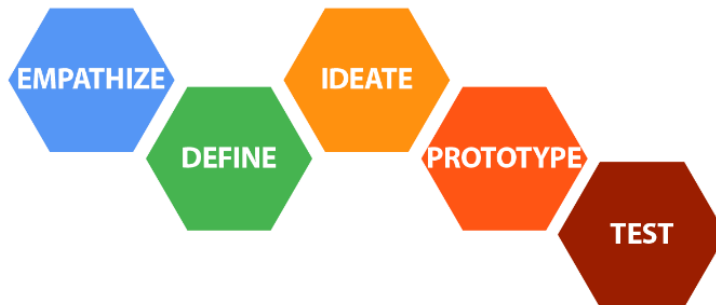
# PROBLEM SOLVING PROCESSES

Create Your Own Process: [Google Slides](#)

## Design Thinking Process

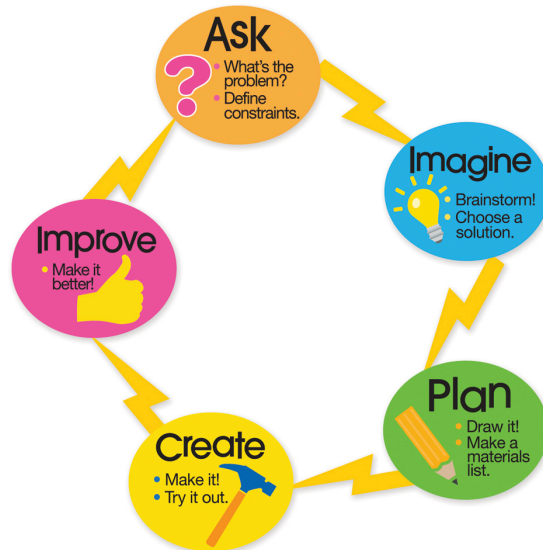
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### Stanford d.school Design Thinking Process



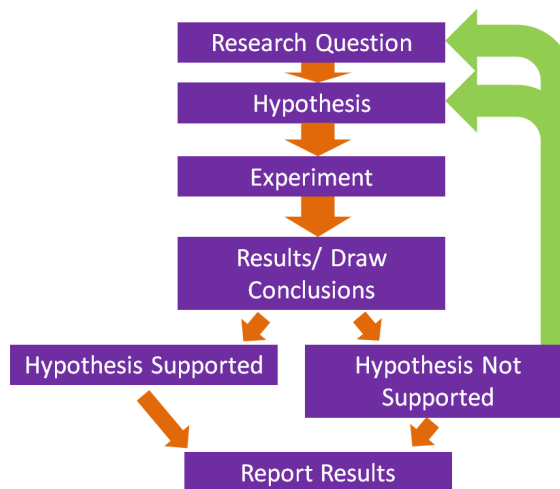
## Engineering Design Process

[Google Slides](#)



## Scientific Process

[Google Slides](#)



# ENERGY PROBLEM CHOICES

## Scenario 1: Recycling Program



You're a conservationist and you've been asked to assist with a recycling program at the landfill. The city is looking to separate metal from landfill garbage. This metal could be reused to make new products, preventing waste. The landfill contains several acres of trash. It would take landfill workers an impossible amount of time to pick through the landfill in search of metal pieces. How can you create an energy-efficient way to quickly separate the metals from the trash?

## Scenario 2: Community Gardens



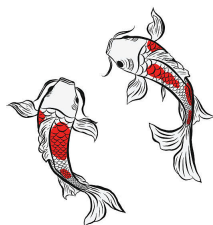
As a community planner, you've noticed several abandoned lots in a neighborhood. After talking with the community, many people have said they'd like to use the lots as community gardens. Can you design a neighborhood program to clean up lots and reuse some of the "trash" to make energy-efficient greenhouses that will grow plants all year long?

## Scenario 3: Visitor Center



You're designing a visitor center at Death Valley National Park. The goal of your project is to create a sustainable, energy-efficient building that takes advantage of the area's natural features for heating and cooling. Your biggest concern, given the hot desert climate, is to design a building that doesn't get too hot and doesn't use too much air conditioning. How can you use the natural desert environment to design an energy-efficient and sustainable building?

## Scenario 4: Koi Fish Survival



To study a kind of fish called koi, you've built a small backyard pond. When the upcoming weather forecast projects freezing temperatures, you begin to worry. While a little bit of ice is not dangerous for koi, if your pond freezes over the koi will not survive. How can you use clean energy to prevent your pond from freezing and keep the koi fish safe?

# SCIENTIFIC EXPLANATIONS

## CLAIM

Statement about the results of an investigation

- A one-sentence answer to the question you investigated.
- It answers, **what can you conclude?**
- It should not start with **yes** or **no**.
- It should describe the relationship between **dependent** and **independent** variables.

## EVIDENCE

Scientific data used to support the claim

Evidence must be:

- **Sufficient** — Use enough evidence to support the claim.
- **Appropriate** — Use data that support your claim. Leave out information that doesn't support the claim.
- **Qualitative** — (Using the senses), or **Quantitative** (numerical), or a combination of both.

## REASONING

Ties together the claim and the evidence

- Shows **how** or **why** the data count as evidence to support the claim.
- Provides the justification for why **this** evidence is important to **this** claim.
- Includes one or more **scientific principles** that are important to the claim and evidence.

*\*Remember:* Read what you've written to be sure it makes sense as a whole explanation.