

TIDEE

Transferable Integrated Design Engineering Education



UNIT 3: Building Competent Teams

Session 2: Recycling PET Bottles, Part I

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Announcements and Objectives for the Day (10 minutes)

Today's session deals with understanding the nature of the problem by gathering information, generating ideas, and determining the best ideas. In particular, the objectives for the session are to:

- Understand how information gathered affects decision making
- Learn how to prioritize results
- Learn how to use a matrix to make a decision
- Learn how to give Reflectors reports to improve process

Identify PET Bottle Characteristics (5 minutes)

This activity primarily gathers information about the issue of concern by examining a PET bottle.

Identify Possible Uses of the PET Bottle (10 minutes)

Generating many creative approaches to the solution provides an opportunity to focus on idea generation.

Identify Criteria for Selecting the Best Ideas (10 minutes)

This activity focuses on developing a problem definition, which defines the requirements to be met by a good solution. These also serve as criteria to select the best idea. They are different than a need statement, which in this case would be to recycle PET Bottles.

Expand the List of Ideas (8 minutes)

This activity uses the iterative nature of the design process to expand the number and quality of the ideas by having the teams:

1. Categorize their initial list of ideas (e.g., toys, containers).
2. Create new idea in these categories and bridging two categories.

Selecting the Best Ideas (4 minutes)

This is a short activity to limit the choices using a quick evaluation and decision making process. The more detailed process is used in the following activity where a shorter list is analyzed.

Using an Evaluation Matrix to Make a Decision (12 minutes)

Learn to use an evaluation matrix based upon criteria established in an earlier activity. This helps take away some of the emotional issues attachment by the individual who suggested the idea. Make sure that the items are listed across the matrix and the selection criteria are listed down the first column of the matrix.

Reflectors Report

It is a good note to end with reflectors reporting on the success of their team for the day, which highlights process improvement and development.

Activity: Identify PET Bottle Characteristics

Objective: Identify the characteristics of the PET bottle that will affect its usefulness.

Tasks

3. Teams examine PET bottle and identify its characteristics.
4. Teams identify characteristics they consider unique to their team.

Deliverables

Team reporter reports how many characteristics were identified and one that may be unique to their team.

Criteria for Success

- Characteristics identified address possible uses, manufacturability
- Unique characteristics identified by each team
- Team develops by all members participating in gathering information

Resources

- A 2-liter PET bottle
- Past experience of team members
- Five minutes of team activity

Activity: Identify Possible Uses of the PET Bottle

Objective: Seek creative ideas and identify many possible uses for recycled 2-liter PET bottles.

Tasks

1. Teams brainstorm ideas for possible uses without criticism of ideas.
2. Teams identify which ideas may be unique to their team.

Deliverables

Team reporter reports number of uses identified and any considered unique to that team.

Criteria for Success

- Each team identifies at least 20 ideas, with each member contributing ideas
- Each team identifies uses that are unique to their team
- Teams create ideas without judging their merit

Resources

- A 2-liter PET bottle
- List of bottle characteristics developed earlier
- Ten minutes of team activity

Activity: Identify Criteria for Selecting the Best Ideas

Objective: Establish criteria for evaluating ideas.

Tasks

1. Add other issues to the following list that would be important to consider if a business were to use the PET bottle for another product, like manufacturability, marketability, desirability, number of products produced before saturation occurs, etc.
2. Evaluate and decide which criteria should be used to determine which recycling ideas should be considered to develop further.
3. Develop specific statements and criteria for evaluation of uses.

Deliverables

Team reporter reports criteria selected to evaluate ideas.

Criteria for Success

- The team identifies criteria specific enough to evaluate ideas.
- Criteria span issues from cost to appearance and manufacturability to environmental friendliness.

Resources

- Team members' understanding of issues important to reuse of materials.
- Information and ideas previously developed.
- Ten minutes of team activity.

Activity: Expand the List of Ideas

Objective: To identify additional ideas using new techniques.

Tasks

1. Teams categorize their initial list of ideas (e.g., toys, containers).
2. Teams seek new idea in these categories and bridging two categories.

Deliverables

Team reporter reports categories and new ideas added.

Criteria for Success

- Each team creates additional ideas
- Ideas of different types are identified

Resources

- List of ideas generated in an earlier activity
- Application of synthesis to expand creativity
- Eight minutes of team activity

Activity: Selecting the Best Ideas

Objective: To identify four ideas the team likes best.

Tasks

The team discusses its ideas and selects their four favorites.

Deliverables

Team reporter reports consensus of team's top four ideas for PET bottle use.

Criteria for Success

- The team agrees on the four best ideas
- Team members learn how to come to a consensus

Resources

- List of ideas generated by previous activities
- Four minutes of team activity

Activity: Using an Evaluation Matrix to Make a Decision

Objective: To use a decision matrix for selecting the best idea that will be developed.

Tasks

1. Review criteria and roughly rank them in categories of critical, reasonable, and not very important.
2. Develop a decision matrix to evaluate your for best ideas using your criteria for evaluation.
3. Teams use the decision matrix to select the team's idea with the greatest merit. Weigh your conclusions based upon the importance of the criteria.

Deliverables

Team reporter reports team's top idea and rationale for its selection

Criteria for Success

- The team uses its criteria for evaluating ideas
- Team members understand how to make a decision based upon criteria
- Team members select the idea they will develop further

Resources

- The evaluation criteria developed in the previous activity
- The four ideas the team selected in as their best in a previous activity
- Twelve minutes of team activity

Decision Matrix

The following is a decision matrix structure that can be used in evaluating ideas. Suggested use is to place a plus (+), check (√), or minus (-) in each cell to indicate good, neutral, or bad relative to each criterion.

	Idea #1	Idea #2	Idea #3	Idea #4	Idea #5
Criterion #1					
Criterion #2					
Criterion #3					
Criterion #4					
Criterion #5					
Criterion #6					
Criterion #7					
Total Score					