

Engineering Design Process Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the primary purpose of the Engineering Design Process?

undefined. A) To create artistic designs

undefined. B) To systematically solve engineering problems ✓

undefined. C) To manage financial resources

undefined. D) To develop marketing strategies

The primary purpose is to systematically solve engineering problems.

Which of the following are steps in the Engineering Design Process? (Select all that apply)

undefined. A) Identify the Problem ✓

undefined. B) Develop a Marketing Plan

undefined. C) Test and Evaluate ✓

undefined. D) Conduct a Financial Audit

The steps include identifying the problem and testing and evaluating.

Describe in your own words what the "Identify the Problem" step involves in the Engineering Design Process.

This step involves recognizing and articulating the specific issue that needs to be addressed.

List two reasons why documentation is important in the Engineering Design Process.

1. Reason 1

It provides a record of decisions made.

2. Reason 2

It helps in evaluating the design process.

Documentation helps in tracking progress and provides a reference for future projects.

Part 2: Understanding and Interpretation

Why is iteration important in the Engineering Design Process?

undefined. A) It allows for skipping steps

undefined. B) It helps refine and improve solutions ✓

undefined. C) It reduces the need for testing

undefined. D) It increases the cost of the project

Iteration is important because it helps refine and improve solutions.

Which of the following best describes the role of prototyping in the Engineering Design Process? (Select all that apply)

undefined. A) To visualize the final product ✓

undefined. B) To test and evaluate the design ✓

undefined. C) To finalize the marketing strategy

undefined. D) To ensure compliance with regulations

Prototyping helps visualize the final product and test the design.

Explain how brainstorming contributes to the Engineering Design Process.

Brainstorming fosters creativity and generates a wide range of ideas for potential solutions.

Part 3: Application and Analysis

If an engineer identifies a new constraint during the testing phase, what should they do next?

undefined. A) Ignore the constraint

undefined. B) Go back to the "Define Requirements" step ✓

undefined. C) Proceed with the current design

undefined. D) Skip to the "Communicate Results" step

The engineer should go back to the "Define Requirements" step to address the new constraint.

In a scenario where a prototype fails to meet certain requirements, what actions can be taken? (Select all that apply)

undefined. A) Redesign the prototype ✓

undefined. B) Abandon the project

undefined. C) Re-evaluate the requirements ✓

undefined. D) Conduct further testing ✓

Actions include redesignING the prototype and re-evaluating the requirements.

Imagine you are tasked with designing a new water bottle. Briefly outline how you would apply the Engineering Design Process to this task.

The outline should include steps like identifying the problem, brainstorming, prototyping, and testing.

Part 4: Evaluation and Creation

Which step in the Engineering Design Process is most likely to involve a SWOT analysis?

undefined. A) Identify the Problem

undefined. B) Research and Gather Information ✓

undefined. C) Test and Evaluate

undefined. D) Communicate Results

The SWOT analysis is most likely involved in the "Research and Gather Information" step.

When analyzing test results, what factors should be considered to determine if a design meets its requirements? (Select all that apply)

undefined. A) Cost efficiency ✓

undefined. B) User feedback ✓

undefined. C) Aesthetic appeal

undefined. D) Functional performance ✓

Factors include cost efficiency, user feedback, and functional performance.

Analyze the relationship between the "Research and Gather Information" step and the "Define Requirements" step in the Engineering Design Process.

Research informs the requirements, ensuring they are based on accurate data and insights.

Which of the following best represents a successful outcome of the Engineering Design Process?

undefined. A) Completing the process quickly

undefined. B) Meeting all defined requirements and constraints ✓

undefined. C) Creating the most expensive solution

undefined. D) Using the most advanced technology

A successful outcome is meeting all defined requirements and constraints.

When evaluating a final design, which criteria are essential to consider? (Select all that apply)

undefined. A) Sustainability ✓

undefined. B) Aesthetic design

undefined. C) Marketability ✓

undefined. D) Safety and reliability ✓

Essential criteria include sustainability, safety, and reliability.

Propose a new design for a public transportation system in a busy city. Outline the key steps you would take using the Engineering Design Process and justify your choices.

The outline should include steps like identifying needs, designing solutions, and evaluating effectiveness.