**Task 1: Research and Summarize**

**1. Zero-shot Prompting**

* **Definition**: The model is asked to perform a task without being shown any examples.
* **Use Case**: Common for tasks where the model already understands the pattern.
* **Example**:  
  Translate this sentence into French: *“How are you today?”*

**2. Few-shot Prompting**

* **Definition**: The model is given a few examples before being asked to perform a similar task.
* **Use Case**: Useful when context or format matters.
* **Example**:

English: "Good morning" → French: "Bonjour"

English: "Thank you" → French: "Merci"

English: "See you later" → French: ?

**3. Chain-of-Thought Prompting**

* **Definition**: The model is prompted to reason step-by-step before giving a final answer.
* **Use Case**: Ideal for math problems, logic, or multi-step reasoning.
* **Example**:  
  *Q: If John has 3 apples and buys 2 more, how many does he have?*  
  *A: Let's think step by step…*

**Task 2: Design and Experiment**

**Topic:** Solving a math word problem

**Zero-shot Example:**  
*Q: A train travels 60 miles in 1.5 hours. What is its average speed?*  
**AI Response**: Often correct but lacks reasoning.

**Few-shot Example:**

Q1: A car travels 100 miles in 2 hours. A1: 50 mph

Q2: A cyclist covers 30 miles in 1.5 hours. A2: 20 mph

Q3: A train travels 60 miles in 1.5 hours. What is its speed?

**AI Response**: More accurate due to learned pattern.

**Chain-of-Thought Example:**

Q: A train travels 60 miles in 1.5 hours. What is its average speed?

Let’s think step by step:

Step 1: Distance = 60 miles

Step 2: Time = 1.5 hours

Step 3: Speed = 60 ÷ 1.5 = 40 mph

Answer: 40 mph

**Effectiveness Summary**

| **Prompt Type** | **Accuracy** | **Reasoning** | **Best For** |
| --- | --- | --- | --- |
| Zero-shot | Medium | No | Simple tasks |
| Few-shot | High | No | Pattern-based logic |
| Chain-of-Thought | High | Yes | Complex reasoning, math, logic |