

IT'S ELECTRIC!

STUDENT LOG

WORKING DOCUMENTS

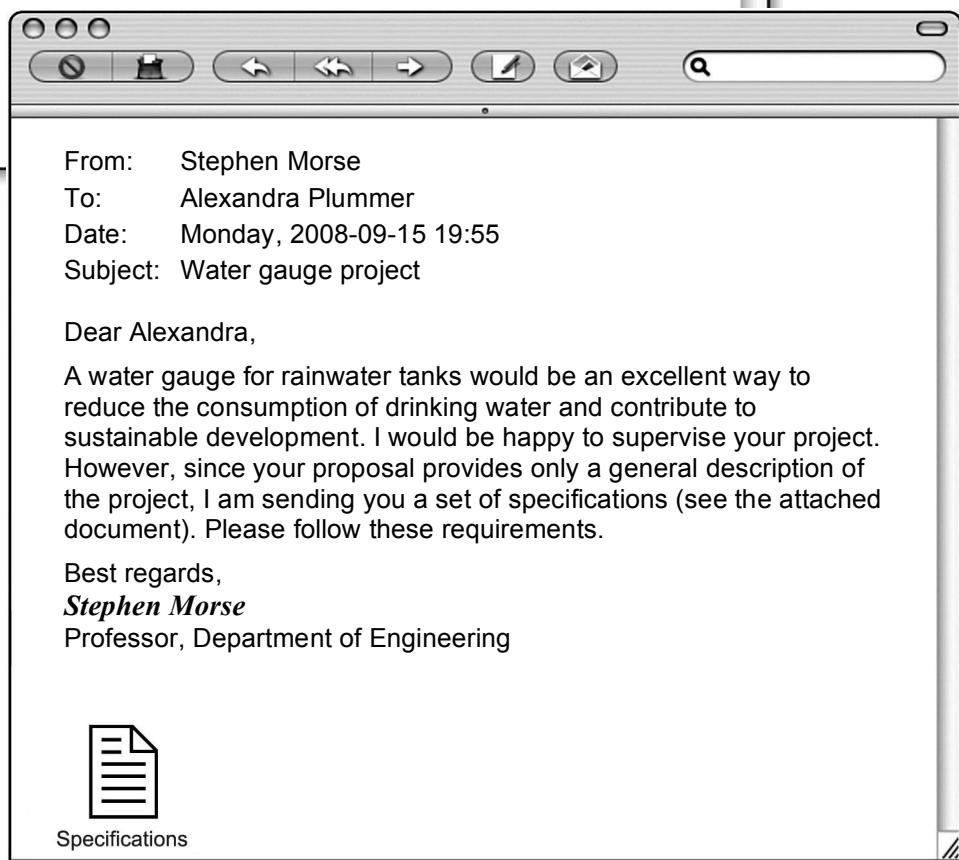
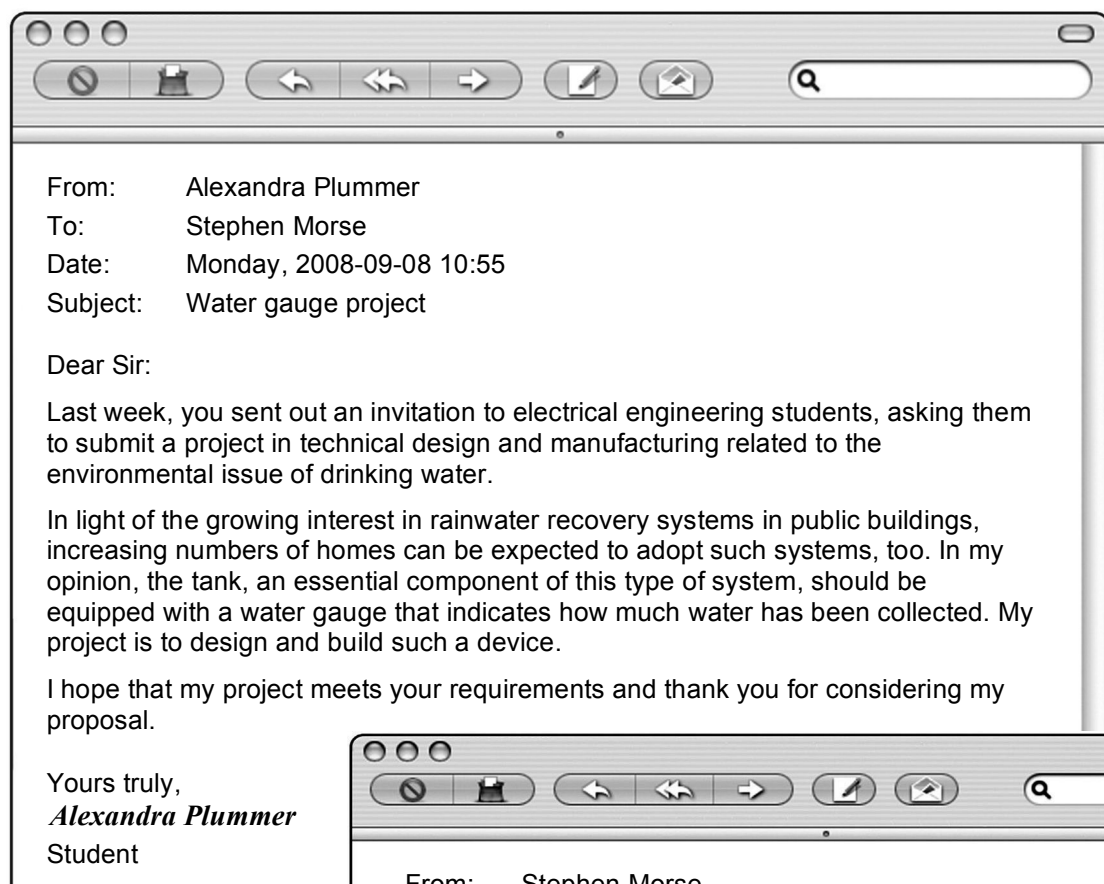
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EVALUATION DOCUMENTS

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PROCEDURE AND EVALUATION: SSC1 – TECHNOLOGY

The project



The project *(continued)*

WATER GAUGE	
Specifications	
<p>General purpose of the prototype</p> <ul style="list-style-type: none"> • The prototype must indicate the water level in a tank. <p>Material constraints</p> <ul style="list-style-type: none"> • The prototype must indicate at least five different volumes. • The prototype must include an electrical system. • The prototype must use as little power as possible. • It must be possible to turn off the electrical system. <p>Human constraint</p> <ul style="list-style-type: none"> • The prototype must be easy to use. <p>Aesthetic constraint</p> <ul style="list-style-type: none"> • The prototype must be neat in appearance without necessarily being in its definitive form. <p>Safety constraints</p> <ul style="list-style-type: none"> • The edges of each part must not be sharp. • The prototype must be safe to use. <p>Financial constraint</p> <ul style="list-style-type: none"> • Using materials responsibly must be a priority. <p>Environmental constraint</p> <ul style="list-style-type: none"> • Using recycled materials must be a priority. 	

In this context, you will play the role of Alexandra Plummer. You will design and build a prototype of a water gauge that measures the water level in a tank.

Creating the context

I ask myself questions

1. a) What is an electrical circuit?

b) What distinguishes direct current from alternating current?

c) Name a source of direct current and a source of alternating current.

2. a) What is the electrical function of power supply?



Creating the context *(continued)*

- b) In the table below, give some examples of components that provide a power supply. Draw the symbol for each component and write at least one advantage and one disadvantage of using it as a power source.

Component	Symbol	Advantage	Disadvantage



Creating the context *(continued)*

3. a) What is the difference between conduction and insulation?

b) Name a component that acts as a conductor and draw its symbol, if it has one.

c) Name a component that acts as an insulator and draw its symbol, if it has one.

4. a) What is the electrical function of protection?

b) Name a component that acts as a protective device and draw its symbol.



Creating the context *(continued)*

5. a) What is the electrical function of control?

b) What is the difference between an open circuit and a closed circuit?

c) Do you think you have to include a control component in the device you are going to design? Explain your answer.

6. a) What is the electrical function of the transformation of energy?

b) Name some electrical components that transform energy and draw their symbols, if they have one.



Creating the context *(continued)*

I think

8. What do you think is the best approach to designing your water gauge? Draw a circuit diagram for this technical object. Make sure you include all the components you need for your device to work.



Reflection

Yes

No

Do I fully understand the concepts covered in this situation?

☐☐

Planning the project *(continued)*

4. Draw the technical diagrams for your prototype. Make sure that you indicate the following:
- the names of the parts
 - the linking components you will use
 - the materials you will use
 - any other useful information



Name: _____

Group: _____

ST

Planning the project *(continued)*

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Reflection

Yes

No

Have I considered other approaches to making each of the parts?

☐☐

Completing the project

I build

1. Build your prototype, following your technical diagrams. Make sure that you record and justify any change you make to your drawings.

2. Did you work safely while building your prototype? Justify your answer with at least two examples of safety-conscious behaviour.

Reflection

Yes

No

Did I record and justify each of the changes I made to my plan of action?

☐☐

Testing the prototype

I evaluate my prototype

After testing your prototype, answer the following questions.

1. Does the prototype fulfill the general purpose described in the specifications? Justify your answer.

2. Does your prototype meet all the requirements of the specifications? If not, explain your answer.

3. Did you alter your plan of action? Explain your answer.



Testing the prototype *(continued)*

4. What difficulties did you encounter while building your prototype?

5. What are the advantages of your prototype?

6. What are the disadvantages of your prototype?

7. What improvements would you make to your prototype?

My evaluation

Use the evaluation grid on the following page to evaluate yourself. Write A, B, C, D or E in the “Me” column of the chart below.

SSC1—Seeks answers or solutions to scientific or technological problems				
Criteria*	Observable indicators	Me	Teacher	Comments
1	Creating the context		<input type="checkbox"/> With help	
	Definition of the goal and completion of the circuit diagram			
2	Planning the project		<input type="checkbox"/> With help	
	Relevance of the elements of the plan of action: list of materials and technical diagrams			
3	Completing the project		<input type="checkbox"/> With help	
	Compliance with the technical diagrams and the safety rules			
4	Testing the prototype		<input type="checkbox"/> With help	
	Analysis of the prototype operation and suggested improvements			

* Evaluation criteria

- 1 Appropriate representation of the situation
- 2 Development of a suitable plan of action for the situation
- 3 Appropriate implementation of the plan of action
- 4 Development of relevant conclusions, explanations or solutions

Evaluation grid

SSC1 Seeks answers or solutions to scientific or technological problems

Criteria*	Observable indicators	A	B	C	D	E
1	Creating the context Definition of the goal and completion of the circuit diagram	The goal is very clearly defined and relevant to the project, AND the circuit diagram is complete.	The goal is very clearly defined and relevant to the project, AND the circuit diagram contains a few minor errors.	The goal is not very clearly defined or is irrelevant to the project, OR the circuit diagram contains many errors.	The goal is not very clearly defined or is irrelevant to the project, AND the circuit diagram contains many errors.	The work must be done again.
2	Planning the project Relevance of the elements of the plan of action: list of materials and technical diagrams	The choice of materials is relevant, AND the technical diagrams are complete.	The choice of materials is relevant, AND the technical diagrams contain a few minor errors.	The choice of materials is not very relevant, OR the technical diagrams contain many errors.	The choice of materials is not very relevant, AND the technical diagrams contain many errors.	The work must be done again.
3	Completing the project Compliance with the technical diagrams and the safety rules	The prototype complies with the technical diagrams, AND the work was done safely.	A few elements of the prototype do not comply with the technical diagrams, AND the work was done safely.	Many elements of the prototype do not comply with the technical diagrams, AND the work was done safely.	The prototype does not comply with the technical diagrams, OR the work was not done safely.	The work must be done again.
4	Testing the prototype Analysis of the prototype operation and suggested improvements	The prototype works and meets all the specifications, AND the suggested improvements are relevant.	The prototype meets most of the specifications, AND most of the suggested improvements are relevant.	The prototype meets most of the specifications, AND the suggested improvements are not very relevant.	The prototype does not meet most of the specifications.	The work must be done again.

* Evaluation criteria

- 1 Appropriate representation of the situation
- 2 Development of a suitable plan of action for the situation
- 3 Appropriate implementation of the plan of action
- 4 Development of relevant conclusions, explanations or solutions