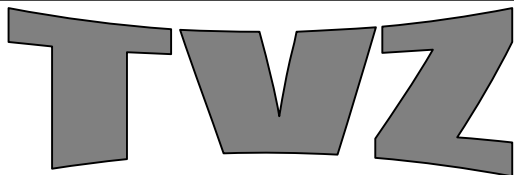


# THE CASE STUDY

 <b>YOUR NUMBER 1 NEWS NETWORK</b>			
<b>ENTERTAINMENT</b>	<b>PROGRAM SCHEDULE</b>	<b>MOVIES</b>	<b>NEWS</b>
<b>HEADLINES</b> <ul style="list-style-type: none"> <li>▶ Higher prices at the pump</li> <li>▶ Disastrous train accident</li> <li>▶ Widespread power outage</li> <li>▶ The government to table new draft bill in September</li> <li>▶ Athletes' participation in Olympics uncertain</li> </ul>		<p>There has been a disastrous train accident, reportedly caused by the collision of a high-speed train and a van.</p> <p>Thirty-two people have been taken to emergency at the regional hospital, some 40 kilometres from the scene of the disaster. The identities of the injured have not been released at this point. We do know, however, that a group of Russian tourists boarded the train in Québec City. Although the condition of the victims is not known, medical authorities have already announced that many of them will need blood transfusions.</p> <p>Medical personnel have to analyze the victims' blood compatibility to determine whether there is an adequate blood supply on hand. Hospital administrators will report on the condition of the injured later today. They may ask people in the region to give blood in aid of the accident victims.</p>	

In this situation, you are to play the role of the medical personnel responsible for analyzing blood compatibility of the accident victims. You have to check if there is a sufficient blood supply and decide whether to organize a blood drive.

Name: \_\_\_\_\_

Group: \_\_\_\_\_

## THE CASE STUDY *(continued)*

Here are the blood types of the accident victims and the quantities of blood they need.

Number of victims	Blood type	Number of litres needed
4	A <sup>+</sup>	8
3	A <sup>-</sup>	9
7	B <sup>+</sup>	14
8	B <sup>-</sup>	18
1	AB <sup>+</sup>	3
1	AB <sup>-</sup>	3
6	O <sup>+</sup>	18
2	O <sup>-</sup>	6

Here are the numbers of litres in the blood supply.

Litres in the blood supply	
Blood type	Litres on hand
A <sup>+</sup>	10
A <sup>-</sup>	14
B <sup>+</sup>	12
B <sup>-</sup>	8
AB <sup>+</sup>	2
AB <sup>-</sup>	2
O <sup>+</sup>	10
O <sup>-</sup>	22

Name: \_\_\_\_\_

Group: \_\_\_\_\_

# CREATING THE CONTEXT

## I ask myself questions

1. What is a blood transfusion?

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2. What is a blood recipient?

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3. What is a blood donor?

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4. What is blood compatibility?

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5. Who are the players in this case study?

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6. What questions should be asked by the person responsible for analyzing the blood compatibility of the accident victims?

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Group: \_\_\_\_\_

**I must**

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- 
- 
- 

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What I know . . .	What I must find out . . .
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Group: \_\_\_\_\_

## I prepare my work

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[illegible]

Yes      No

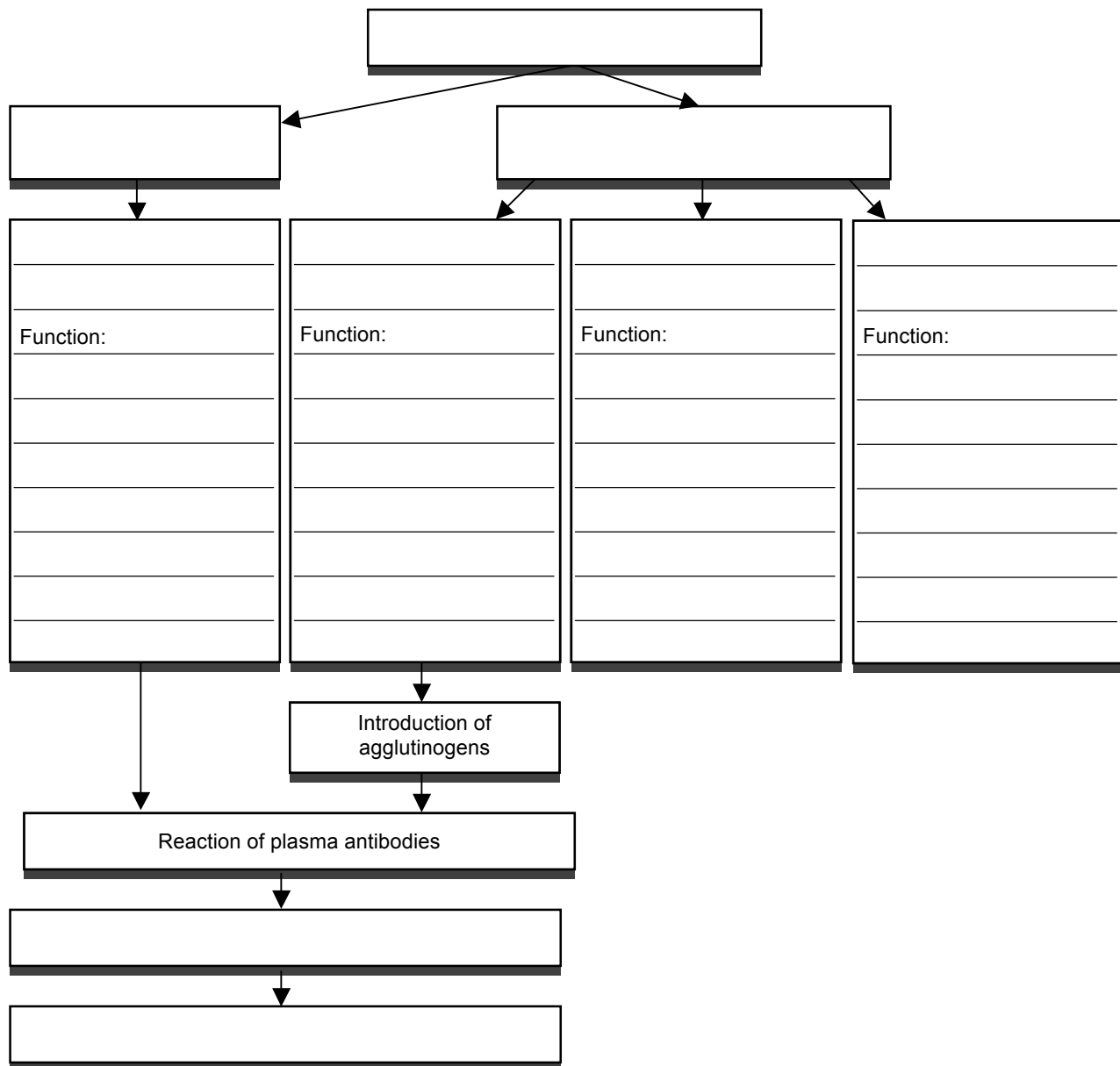
10/10

# GATHERING INFORMATION

## I do research

1. The concept map on this page represents the composition of blood and shows the role of its constituents when blood types are incompatible. Write the following words in the proper spaces in the following diagram and define the function of the blood constituents.

- |                                    |                                  |                                  |
|------------------------------------|----------------------------------|----------------------------------|
| • Agglutination of red blood cells | • White blood cells (leukocytes) | • Liquid element                 |
| • Blood clotting                   | • Platelets (thrombocytes)       | • Plasma                         |
| • Formed elements                  |                                  | • Red blood cells (erythrocytes) |



Name: \_\_\_\_\_

Group: \_\_\_\_\_

## GATHERING INFORMATION *(continued)*

2. Name the four blood types.

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3. How are the blood types distributed within the Québec population?

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### I apply my research results

4. You have to match the victims' blood types with the blood supply. Use the following table to determine which types of blood the victims can receive.

Number of victims	Blood type	Litres needed	Potential blood types
4	A <sup>+</sup>	8	
3	A <sup>-</sup>	9	
7	B <sup>+</sup>	14	
8	B <sup>-</sup>	18	
1	AB <sup>+</sup>	3	
1	AB <sup>-</sup>	3	
6	O <sup>+</sup>	18	
2	O <sup>-</sup>	6	

### Reflection

Yes No

Have I clearly understood:

- the functions of the blood constituents?
- blood compatibility?

☐ ☐
☐ ☐

Name: \_\_\_\_\_

Group: \_\_\_\_\_

# COMPLETING THE CASE STUDY

## I make suggestions

1. Indicate how many litres of blood of each type you could prescribe for the victims. Maximize use of the blood supply.

Number of victims	Blood type	Litres available	Litres needed	Possible blood types	Litres to be transfused, by blood type
4	A <sup>+</sup>	10	8		
3	A <sup>-</sup>	14	9		
7	B <sup>+</sup>	12	14		
8	B <sup>-</sup>	8	18		
1	AB <sup>+</sup>	2	3		
1	AB <sup>-</sup>	2	3		
6	O <sup>+</sup>	10	18		
2	O <sup>-</sup>	22	6		

2. Will there be enough blood to help all the victims?

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3. What will be your recommendation to hospital administrators?

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## Reflection

Have I considered various solutions?

Yes

No

☐
☐



Group: \_\_\_\_\_

# MY EVALUATION

Use the evaluation grid on the next page for your self-evaluation. Write A, B, C, D or E in the appropriate spaces in this table.

<b>SSC2 Makes the most of his/her knowledge of science and technology</b>				
Criteria*	Observable indicators	Me	Teacher	Comments
<b>1</b>	<b>Creating the context</b>		<input type="checkbox"/> With help	
	Definition of the case study goal and formulation of questions for gathering information			
<b>2</b>	<b>Gathering information</b>		<input type="checkbox"/> With help	
	Determination of compatible blood types			
<b>3</b>	<b>Completing the case study</b>		<input type="checkbox"/> With help	
	Prescriptions and recommendation			
<b>4</b>	<b>Validating the case study</b>		<input type="checkbox"/> With help	
	Justification and explanation of the solution			

## \* Evaluation criteria

- 1 Formulation of appropriate questions
- 2 Appropriate use of scientific and technological concepts, laws, models and theories
- 3 Relevant explanations, solutions or actions
- 4 Suitable justification of explanations, solutions or actions

Name: \_\_\_\_\_

Group: \_\_\_\_\_

# EVALUATION GRID

## **SSC2** Makes the most of his/her knowledge of science and technology

Criteria*	Observable indicators	A	B	C	D	E
<b>1</b>	<b>CREATING THE CONTEXT</b> Definition of the case study goal and formulation of questions for gathering information	The questions for gathering information are relevant. The case study goal is very clear.	The questions for gathering information are relevant. The case study goal is clear.	The questions for gathering information are more or less relevant OR the case study goal is more or less clear.	The questions for gathering information are more or less relevant AND the case study goal is more or less clear.	The work needs to be redone..
<b>2</b>	<b>GATHERING INFORMATION</b> Determination of compatible blood types	The compatibility analyses are adequate.	The compatibility analyses contain a few errors.	The compatibility analyses contain many errors.	Most of the compatibility analyses are inadequate.	The work needs to be redone.
<b>3</b>	<b>COMPLETING THE CASE STUDY</b> Prescriptions and recommendation	The suggested prescriptions and the recommendation are relevant.	The suggested prescriptions contain a few errors, but the recommendation is relevant.	The suggested prescriptions contain many errors OR the recommendation is not relevant.	The suggested prescriptions contain many minor errors AND the recommendation is not relevant.	The work needs to be redone.
<b>4</b>	<b>VALIDATING THE CASE STUDY</b> Justification and explanation of the solution	The justifications and explanation are relevant and very clear.	The justifications and explanation are relevant and clear.	The justifications are more or less relevant OR the explanation is not clear.	The justifications are more or less relevant AND the explanation is not clear.	The work needs to be redone.