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BIOLOGY 1: TEACHER'S NOTES THE HIERARCHY OF CELLS

NATIONAL CURRICULUM LINK

CELLS AND ORGANISATION

- the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms

GUIDANCE ON THE ANALOGY

Student interpretation of the analogy can vary and still be correct. However, as a general guide, the individual police officers are representing individual cells. When they work together to carry out the same role this is representing tissues. When the units work together within a police force this is representing various tissues working together as an organ. When various police forces work together as the UK Police, this represents an organ system. The organism could be discussed as being similar to all the international police forces working together. Students should identify flaws in the analogy. For example, there not being the same number of organisation levels as within the body (which is five); the police officers are all the same in terms of their structure (ignoring differences in appearances and characteristics) whereas cells can have completely different structures to suit their roles (e.g. nerve cells and red blood cells); and the police officers within a unit may have slightly different roles, or attend different jobs, whereas all the cells in a tissue carry out the same function.

Please refer to the generic guidance on pp 7–8 on how to use the following ACE Learning Ladder.

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BIOLOGY 1: TEACHER'S NOTES THE HIERARCHY OF CELLS

ACE LEARNING LADDER

Performance	Students may:
Advanced	<ul style="list-style-type: none"> • Explain in detail how the police force analogy explains the hierarchical organisation of cells. • Explain the limitations of the police force analogy compared to the actual hierarchical organisation of cells. • Explain how the analogy could be improved or suggest and explain your own model for hierarchical organisation of cells.
Confident	<ul style="list-style-type: none"> • Describe how the police force analogy represents the hierarchical organisation of cells. • Describe the differences between the police force analogy and the actual hierarchical organisation of cells. • Describe how the analogy could be improved.
Establishing	<ul style="list-style-type: none"> • Match the parts of the police force analogy to the key parts of the hierarchical organisation of cells. • State one problem with the analogy. • State how the analogy can be improved.

BIOLOGY 1: STIMULUS SHEET

THE HIERARCHY OF CELLS

I am a police officer.
My colleagues and I all
make up the emergency
response unit.
Our job is to answer
emergency calls.



I am a police officer too.
My colleagues and I all
work on the dog unit. We
use dogs to find people
and property.



All our units
work together for
Southtown Police
Force. We protect
the people of
Southtown.

I am a police officer
too. My colleagues
and I work for the
investigation unit
as detectives.
Our job is to solve
serious crimes.



Southtown Police Force
work alongside all the other
Police Forces in the UK to
protect the country. I think
that all together we are like
cells in the body. What do
you think?

POSSIBLE KEYWORDS TO USE:

cell, different, level, organ, organ system, organisation, role, similar, tissue

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BIOLOGY 1: DISCUSSION STARTERS THE HIERARCHY OF CELLS

What does the analogy describe or explain?

- I think each police officer would represent...
- I think the special units (e.g. the dog unit) represent...
- All the police officers in each unit do the same job, this is important because...
- I think Southtown Police Force could represent...
- I think all the UK Police Forces together could represent...

What are the limitations of the analogy?

- The analogy has four levels of organisation. This is/is not the same as in the body because...
- Using police officers as an analogy to explain how cells are arranged in the body is good because...
- Using police officers as an analogy to explain how cells are arranged in the body is not good because...

How could the analogy be improved?

- The analogy could be improved by...
- I would adapt the analogy by ...
- A better analogy would be...
- I would improve the analogy by...