



problem

plan

data

analysis

conclusions

# Problem

What have you noticed? What would you like to investigate?

I wonder...?

How much...?

Can I find out if...?

To what extent...?

Is it the case that...?



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# Plan

How will you collect information (**data**) to answer your question (**problem**)?

What have you chosen to collect as data?

How could you record this data?

What sorts of details do you need?

Who else will need to use or understand the data?

What do you think the possible answers could be?



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# Data

How will you collect and organise the data?

How can you collect your data?

How can you organise your data?

What different ways can you think of to represent this information?

What does your plan or question need you to do with your data?

Are you sure that all the details are correct? Are you missing any data?



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# Analysis

What have you found out?

What do you notice  
or wonder?

Looking at the data,  
what can you tell?

What can't you tell?

What kinds of graphs  
or charts or tables or  
diagrams could you use to  
share your information?

Are there shapes or patterns  
that tell you something  
interesting?



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# Conclusion

Can you answer your question?

Does what you found out make sense? Is it what you expected?

What was effective about how you tried to find out what's going on? What were the challenges and limitations?

Do you need more information to answer your question or problem?

Are there new problems you need to think about?

How can you use what you have learned to create change?

## What is data literacy?

Data literacy is the set of skills and concepts which people need to understand, interpret, and make decisions based on the data they encounter in the world around them.

The phrase data literacy connects with curiosity: how to explore the world and answer questions, building the skills and habits of mind for data-problem solving. There is no official area or topic labelled data literacy within Curriculum for Excellence, but it is embedded firmly across the curriculum in outcomes for Maths (Data and Analysis, Chance and Uncertainty), Literacy (Finding and Using Information), Technologies (Computing Science and Digital Literacy) and Social Studies (People in Society, Economy and Business).

## Why does it need exploring?

Data Explorer Cards use a problem-solving approach PPDAC: Problem, Plan, Data, Analysis and Conclusions. This cycle is a bridge between exploratory, curiosity-driven learning and the formal methodological approaches employed by adult data scientists and statisticians. Curiosity, creativity, and communication are key to being good data problem-solvers.

The cards draw together aspects of data literacy to make it easier for learners to understand the data problem-solving cycle, and how their skills and understanding of key concepts connect.

Young people benefit from project-based learning where they take ownership of the problem-solving cycle to pursue an interest. Learners who are still developing their self-directed learning skills and the meta-cognitive abilities to plan, monitor and evaluate their progress in a task will require support to manage this. These cards will help to scaffold this exploratory process without limiting the creativity of learners' engagement.



Find out more about this approach in *Teach Data Literacy: a guide for primary teachers*

[dataed.in/teachdata](https://dataed.in/teachdata)

The *Data Explorer Cards* are part of the Data Education in Schools' commitment to developing interdisciplinary and engaging resources for teachers. By Holly Linklater and the Data Education in Schools team. Graphic design by Elspeth Maxwell. Edinburgh, 2023

## What's inside?

There are 5 sets of cards in this pack: *Birds!* *Lego!* *Lost property!* and *Plastic!* and a blank set for your own topic. Each set has 5 cards, one for each stage of the PPDAC cycle: Problem, Plan, Data, Analysis and Conclusions. Questions on each card support learners to explore each stage of the cycle and investigate the topic.

## Plan and use

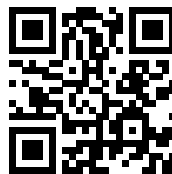
You can use the cards with whole classes, groups, or individual learners. The cards will support collaborative conversations: group work, class buddy activities, or for visiting students or helpers to lead inquiries. The digital slides (scan QR code) could be used for whole class teaching prior to independent work.

One card could be used to structure a series of 5-minute conversations over a week, or a lesson. A set of cards might inform an investigation over several weeks. Cards from across topic sets could be used concurrently to enable your teaching to focus on core data literacy skills and concepts. For example, 5 groups within a class each could

each use the “Problem” card for a different topic. Or, use of the cards could be integrated into teaching other areas of the curriculum – for example as literacy texts. The “conclusions” card in *Plastics!* could be used to support teaching about persuasive writing... The possibilities are endless.

## Adapt

Learning is most powerful when children and young people work with data which is personally meaningful. The topics and questions are intentionally open-ended and easy-to-adapt. For example, you could apply the questions on the cards to alternative themes – *Birds!* could become *Bugs!* The cards for your own theme are a copiable resource.



Scan QR code for digital slides:  
<https://dataed.in/cards>

For further ideas and support materials, or to share what you have done, visit our our website:  
[www.dataschools.education](http://www.dataschools.education)