

Thinking, Problem-Solving and Decision-Making



As you become better at Thinking, Problem-Solving and Decision-Making, you will have more difficult tasks. For example, you will move on from following the method your teacher shows you to trying things out for yourself. This involves learning what works and why, and why some alternatives don't work or aren't suitable. Over time you will not always need the teacher's help to decide what to do. You'll be ready to work out for yourself what you intend to do and how to succeed. As you get more confident, you'll be ready to do more on your own and show what you know, understand and can do in the subject.

This table explains how to tell when you are getting better at working out how to solve problems and deciding the best way forward. You can use it to judge how well you're doing in some ways of thinking and working, and what you need to improve.

NOTE: Don't worry if sometimes you can do things well and feel confident and at others you are confused and not sure what to do. That's to be expected. You won't be good at everything straight away. Instead, think about what you are doing well and where you might need to do things differently in order to improve.

	Novice	Apprentice	Practitioner	Expert
<p>Do you spot the patterns that sometimes suggest things belong together, and at other times see the reasons for keeping them separate?</p> <ul style="list-style-type: none"> Put things in order, tell things apart, compare and contrast. 	<p>You recognise why things are alike when the teacher points out the similarity. You can apply this to other examples.</p> <p>For example, once the teacher has explained to you the features of mammals, you can use this information to classify animals into mammals and non-mammals.</p>	<p>You suggest why some items might belong together and sort them into groups, trying different ways of making a link to see which best describes the situation.</p> <p>For example, is it better to group items together by height, shape, colour, number or some other feature?</p>	<p>You think about different ways items might be connected or separate. You try fitting them into different groups to see what the experiment shows. You use your findings to understand what's happening.</p> <p>For example, if you had to sort a collection of pebbles, should you arrange them by colour, weight, size, or another quality? What difference does each method of sorting make to the result?</p>	<p>You can use different ways to tell apart items that appear similar and make conclusions based on your findings.</p> <p>For example, spiders, flies and moths are all insects, but we can easily tell them apart: what makes a spider a spider and not a fly?</p> <p>Based on what you've found out you can suggest what will happen next, and test your thinking to find out what's going on and what it might mean.</p>
<p>Ask yourself when you should believe something based on evidence, and when the evidence isn't good enough.</p> <ul style="list-style-type: none"> predict what will happen next; decide what evidence counts; and recognise facts from opinions. 	<p>You understand why some types of information are more useful when you're doing particular sorts of work.</p> <p>For example, you can make up your own mind about whether you like a particular story; but if you need to explain this to someone else, you must explain why you think that.</p>	<p>You can see that you need different types of reasons depending on what you're doing.</p> <p>For example, in science you can use experiments to show why something is true or untrue. The evidence comes from the experiment producing the same result every time.</p>	<p>You see that it's not always easy to decide whether to believe what is said. So you look for more and better reasons that help explain why this might be so.</p> <p>For example, you know the difference between fact and opinion, and when you need to have facts.</p>	<p>You can use your observations to explore what's going on, collecting evidence and deciding whether it is fact or opinion and whether you need more evidence to find out for sure.</p>

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<p>Say what you think should happen and give reasons why. Spot when someone else's reasons might not be right. Say why you expect something to happen or how likely it is to happen.</p> <ul style="list-style-type: none"> make links between cause and effect. 	<p>You make the link between what you've seen happen and what's likely to happen next and, when it's explained, you see why one event caused another to happen.</p>	<p>You don't think that things will happen in the same way every time, and instead try to find out the cause and what's most likely to happen, looking for reasons and explanations.</p>	<p>After seeing some examples, you start to draw conclusions about what's happening and can suggest what's most likely to happen and why. You can test your ideas by predicting what will happen next, and then checking that it works the way you expected, or if you need to change your explanation.</p>	<p>You can see where an argument for or against something is using good reasons, or that the reasons given are open to doubt.</p> <p>You can explain why the reasons you've discovered are good or, if they are biased or unreliable, why you should doubt them.</p>
<p>Sum things up and say what you think is happening, but also see where you're not completely sure yet Reach a conclusion</p> <ul style="list-style-type: none"> Say why you approached your work in a particular way, why you thought that your course of action was right, and why you decided what you did. 	<p>With some help, you think about what's happening and what this might mean. You can say what you think, even if you know you don't know the full picture yet.</p> <p>You can follow instructions to sum up what you have seen or discussed in the lesson or topic.</p>	<p>You can see that you might need to know what other people think or say, as well as what you've seen yourself. You find out more about other possible interpretations before making your mind up.</p> <p>You can tell other people about what you've been looking at or what's happened in general terms.</p>	<p>You investigate things to find out what's going on, and try to find explanations that help you understand.</p> <p>You can explain to someone else what has happened and what conclusions you can draw. You can also say whether you are still not sure.</p>	<p>You examine things deeply, following up what you find so that you gradually understand more and more.</p> <p>When explaining what you've discovered you can bring the different parts together and say which are most important and why.</p>
<p>See what other people have said, and see if it's useful to understanding better See things from other points of view</p> <ul style="list-style-type: none"> Think of what you want to try and how to do it. Look back and see how well ideas worked. 	<p>You start to compare what you do to what others do and if necessary change what you do.</p> <p>With some help, you can work out what to do.</p>	<p>To help form an idea, you ask others about what they think, or look at what has worked well in the past and what could be improved.</p> <p>You can see where to begin when given a problem to solve or an activity to do.</p>	<p>You see what works somewhere else or what you already know about, and do something similar to achieve the same result. As you work, you check to make sure that you are progressing as you planned.</p> <p>You know there are different ways to get where you want to be, and choose one that might solve the problem or help you move on to the next stage of the job.</p>	<p>You know how to find new approaches if you hit a snag, and don't let difficulties hold you back. You try alternatives, look for answers or ask for advice if you need it.</p> <p>If something doesn't work first time, you make changes and try again or ask others in the group to try alternatives until one of you finds which will work best.</p>

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<p>Assess the advantages and disadvantages of a situation, think about what's most likely to happen, and how to deal with the disadvantages</p> <p>Make decisions</p> <ul style="list-style-type: none"> Think about different options and weigh up pros and cons 	<p>With some help you can figure out how to make improvements, if things are not going smoothly.</p> <p>With some help or reminders you can list some advantages and disadvantages of what you're thinking about doing.</p>	<p>With the good and bad points in mind, you figure out a solution that has a chance of working. You include a less favourable idea if you think it could be beneficial in some way, even if you think it is risky.</p> <p>You can list and explain the advantages and disadvantages of your approach.</p>	<p>You weigh-up the options, considering what might go wrong so that you're ready to react if things change.</p> <p>You decide what to do and how to do it after considering what might happen in different circumstances.</p>	<p>Your plan makes allowances for difficulties you might encounter, so that you have several options ready if you have to make changes to keep on track.</p> <p>You use previous experience to decide what to do.</p>
<p>Use different solutions depending on the type of problem. Thinking about what to try, what worked and why</p> <p>Solve problems</p> <ul style="list-style-type: none"> What sort of questions should you ask to find what you want to know? 	<p>You can follow the stages to approach a problem when shown how to do it. You think about questions to ask that will help you work towards a solution.</p>	<p>You can use techniques you've used previously to solve a new problem. You can think of good questions to ask to find out what you want to know next.</p>	<p>If you get stuck and what worked before isn't solving the problem, you can try something else. You ask careful questions to understand what's going on.</p>	<p>You have several ideas to try and can work through the possibilities until you find a solution. You experiment, asking yourself why one approach works better than another. You can explain why an approach worked well and what you could improve.</p>
<p>Adapt what you already know about and can do, so that you can apply this to a new situation. Use what you know and understand from one subject in others.</p> <p>See how things fit together.</p> <ul style="list-style-type: none"> Make connections between what you've learned in different subjects. 	<p>With some help, make a plan using something you already know how to do for a new topic or problem.</p>	<p>Make changes to something you already know how to do so that you can use it with a new topic or problem.</p> <p>For example, you can write a report on an experiment in Science or sources you've looked at in History. Each type of report needs to have different sorts of information. Decide what sort of information you need to include in a report for a different purpose.</p>	<p>You can see where using an approach you are familiar with will help you to understand a new topic.</p> <p>For example, will you need mathematical information, measurement or calculations? Will a diagram or a graph help? Perhaps you need pictures or words. Use what you already know to help you work through a new topic. Say why including particular things will help you to complete the task or answer the question.</p>	<p>As well as using information and approaches you've used previously, you can invent or find new approaches to try.</p> <p>You don't let difficulties hold you back and keep trying to find a solution that works.</p>