A TOOLKIT
for Soft Skills Development for Young People

PROBLEM SOLVING AND ANALYTICAL SKILLS

PROBLEM SOLVING AND ANALYTICAL SKILLS

What they are and why they're important

- Do you love the challenge of tackling a difficult problem?
- Are you able to spot connections which other people don't easily see?

Our lives are constantly throwing up problems and challenges. Sometimes we go out of our way to avoid dealing with these, but our problems rarely go away of their own accord, and eventually, we'll have to deal with them.

Thankfully, problem solving is a skill which can be learned along with all the others. Learning to apply these skills to the real problems which present themselves can make you stronger and more confident as a person. You'll be able to deal with life's challenges in more positive and proactive ways.

How to use this toolkit

You can either use the sections of the toolkit on your own or as part of a group. Your tutor/mentor/ support worker will help decide which approach is better suited to meet your individual needs.

If you have not done so already, then read the 'Introduction and Guidance' section which gives an overview of how to get the best out of your use of the UMJ toolkit.

If you need more space to write down your thoughts or actions then use additional sheets of paper.

PROBLEM SOLVING AND ANALYTICAL SKILLS

Learning Outcomes

In this section, you will:

- Reflect on how you currently solve problems and arrive at solutions.
- Think about some different aspects of problem solving and analytical skills, and which of these could be applied in a range of scenarios.
- Plot out your own abilities to solve problems and think analytically, and decide how you might need to improve these skills
- Identify a situation or task you are involved in, and plan to apply some problem solving and analytical techniques whilst involved in this.
- Evaluate how your skills have developed as a result of this activity, and how you plan to keep on developing your adaptability skills.

Remember! Your skills won't develop overnight. You will need to give some time to work through these activities, go away and try out your skills, then come back and see how much your skills have improved.

If you need help, ask someone to work through this section with you. This could be a teacher, youth worker, coach, mentor or employment advisor, or someone in a similar role.

You're on a journey, and in this stage of the journey, you'll develop some problem solving and analytical skills in some situations you might find yourself in. But first, let's see where you're at before you start this stage of the journey. It's time to take a skills check.

You may find this chart helps you to plan and track your progress through your journey:

Aspect	Date started	Date finished	Your notes
Initial skills check			
Development activities			
Action planning			
Developmental activities			
Reflection, evaluation and 2nd skills check			
Moving on			

BEFORE THE JOURNEY – SKILLS CHECK

Do you enjoy solving puzzles and riddles?
Look at the following puzzles and see if you can 'think outside the box' to solve these. How long did it take you to find the solutions?

A. There are six eggs in the basket.
Six people take one egg each. There is one egg remaining in the basket. How?

Your answer:

B. A man and his son are in a car accident. The man is killed and the child is rushed to hospital in an ambulance. When he arrives at the operating theatre, the surgeon says, 'I can't operate on this child, he's my son.' How can this be?

Your answer:

C. A woman lives on the top floor of an apartment building. Every morning she takes the lift to the ground floor. Upon her return, she can only travel half way up the floors and uses the stairs for the rest of the way, unless it's raining. Why?

Your answer:

D. I am a man with no brothers or sisters, but this person's father is my father's son.
Who is this person?

Your answer:

How were you feeling when trying to solve these puzzles?

Level	Challenged	Interested	Curious	Confused	Frustrated	Bored
High						
Medium						
Low						

For the answers turn to the back of this section.

Now, complete the Skills Check.

Step 1:

Indicate the places on the chart which best represents where your skills are at.
You can shade or colour in the grid, or mark with a X and then draw a line to plot out your skills.
You can do this by yourself if you want to. If you're not sure how to complete this, ask for help.

		Emerging		Consolidating		Established
		Never – I struggle with this	Hardly ever	Sometimes	Usually, but not always	Always – no problem!
	Example: *I see problems as opportunities for development and learning*	1	2	3	4	5
1	I try to find the root causes of problems before launching into finding solutions	1	2	3	4	5
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3	I enjoy doing word puzzles, number puzzles, jigsaw puzzles or solving riddles	1	2	3	4	5
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7	I constantly ask why things are the way they are, and try to understand how the world works	1	2	3	4	5
8	I make sense of lots of pieces of information and see the connections between ideas	1	2	3	4	5
9	I am persistent and don't get distracted when trying to solve problems	1	2	3	4	5
10	I know my limitations when faced with problems and am happy to ask for help if I need it	1	2	3	4	5

Shade in the box which indicates your overall problem solving skills level.

Overall, my problem solving and analytical skills are:	Emerging	Consolidating	Established

Emerging = your skills are starting to develop.

Consolidating = you're practicing and developing your skills, but you're not quite there yet.

Established = your skills are well developed, and have become part of how you naturally do things.

Step 2:

Ask someone who knows you well to shade or mark the spaces which best represents where you're at. This could be a teacher, youth worker, mentor or employment advisor, or someone in a similar role. They must not look at your answers!

Peer reflection carried out by:		Emerging		Consolidating		Established
Relationship:		Never – I struggle with this	Hardly ever	Sometimes	Usually, but not always	Always – no problem!
	Example: *Sees problems as opportunities for development and learning*	1	2	3	4	5
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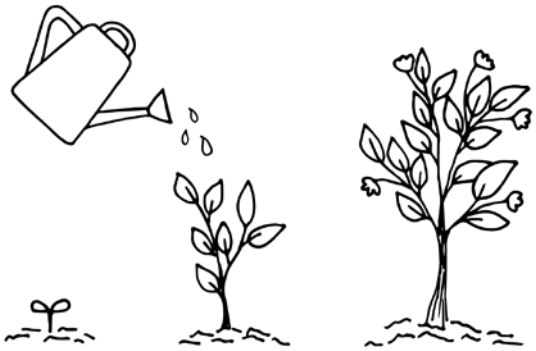
Shade in the box which indicates their overall problem solving skills level.

Overall, their problem solving and analytical skills are:	Emerging	Consolidating	Established



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Step 3:

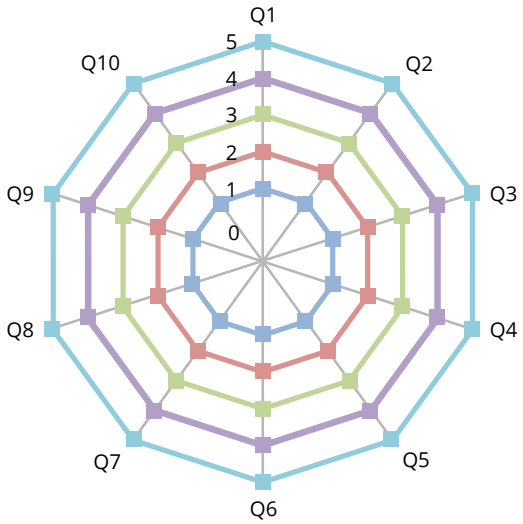
Next, plot your answers on the spider web diagrams below.

Q1 - Q10 represents the questions. On each question, if you answered 5, circle the blue cross. If you answered 4, circle the purple cross. If you answered 3, circle green; 2 circle red; 1 circle dark blue.

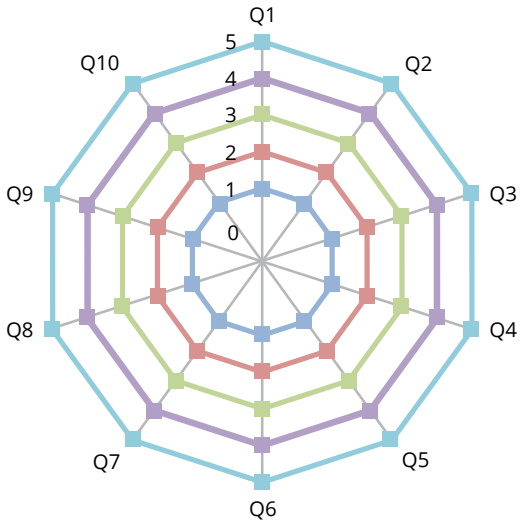
When you have circled all the crosses, right around the web, you should join each cross with a black line. The final diagram should look something like a spider's web and can be lots of different shapes depending on your answers.

If you need more help, look in the **Instructions and Guidance** section for how to do this.

My responses:



The other person's responses:



Discuss your different grids.

- Are your finished diagrams the same or different?
- Do other people see you the same way you see yourself?

Decide together what your strong and weak areas are, and make sure you both agree.
List your strengths and weaknesses below.

What are your three **weakest** areas?	What are your three **strongest** areas?
Area 1:	Area 1:
Area 2:	Area 2:
Area 3:	Area 3:

Your strongest areas might be problem solving and analytical skills you're good at, but you can always improve. Your weakest areas are definitely areas you should think about improving.

Remember that the levels are personal to you and reflect your habits, knowledge and experience and cannot be compared with other people who will have different backgrounds.

YOUR NOTES

CONTINUING THE JOURNEY – DEVELOPMENT ACTIVITIES

Thinking about problem solving and analytical thinking

You're already on a journey, because you're already involved in some kind of activity or project which means that you will have to solve problems and come up with solutions. This section is slightly different to the others. Instead of introducing 10 Actions, you'll look at three well-known methods to solve problems.

The '5 Whys' Approach to identifying problems[1]

Finding out the root cause of a problem can often be useful before starting to think about possible solutions. In this approach, you simply ask 'why?' five times, to track the origins of the problem backwards.

The following problem occurred in a restaurant kitchen. At first it seems like it's the new employee's fault, but by asking 'why' five times, we can see that he's not completely to blame.

The sink is blocked. Why is the sink blocked?	Because a new employee poured oil down it. Why did he pour oil down it?	Because the food recycling bins weren't there. Why weren't the recycling bins there?	Because the new employee put them back in the wrong place. Why did he put them back in the wrong place?	Because nobody has told him about recycling food waste yet.

Think about a problem you recently experienced in your work, study or home life. Can you apply the '5 Whys' approach to this problem?

1 See: https://en.wikipedia.org/wiki/5_Whys

Skills in Context – Problem solving and analytical thinking

Being able to solve problems creatively and effectively is a skill which is highly valued in the workplace. It's also a valuable skill in all aspects of life. If you feel defeated by life's problems, you're unlikely to have the confidence to tackle new problems as they arise, and you may even go through life avoiding problems.

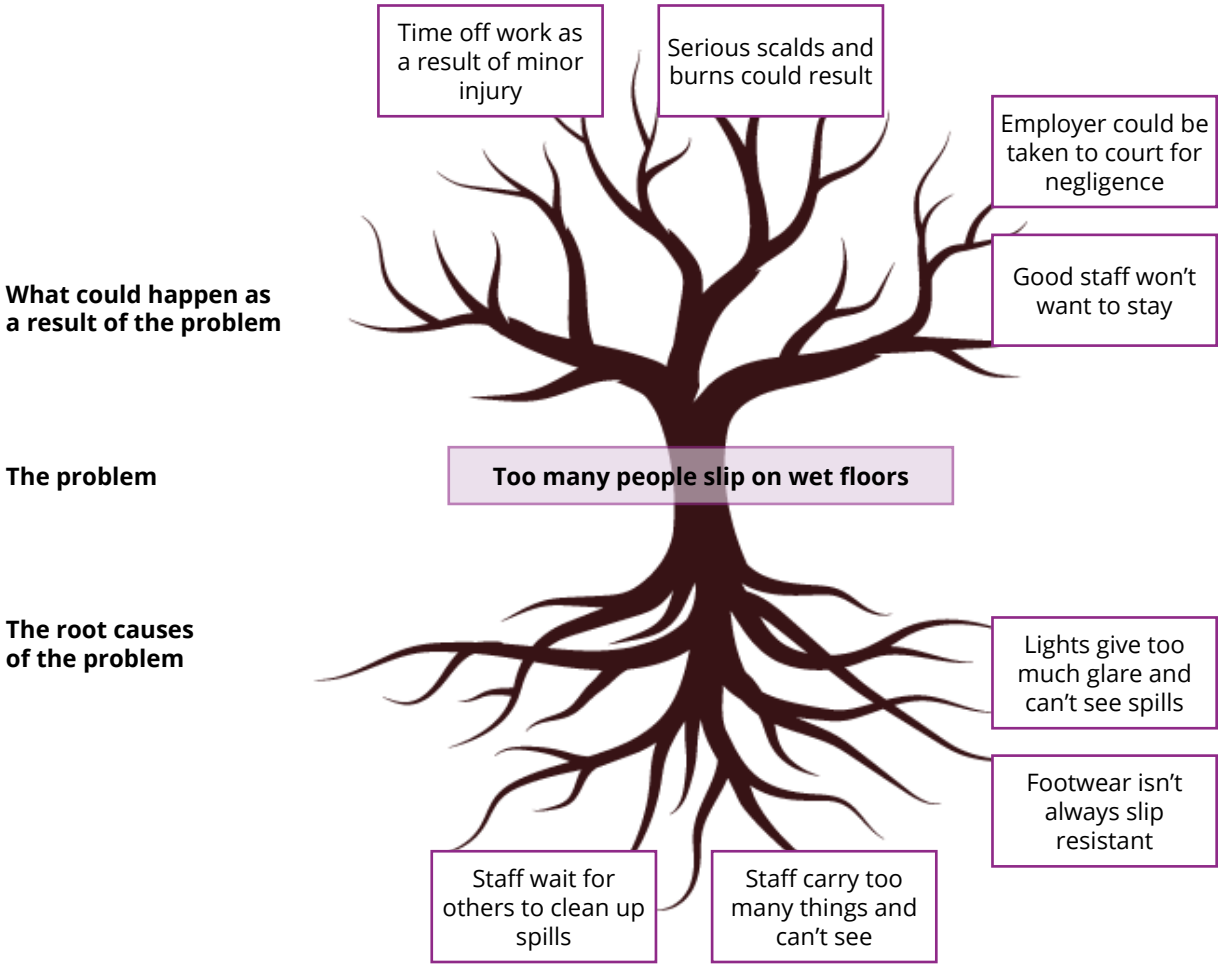
Fortunately, however, problem solving is a skill which can be learned, and there are various methods and techniques to help you with this.

One way of thinking through problems is the Problem Tree & Solutions Tree[2].

You've started work in a restaurant kitchen. It's only your first week, but you've noticed that three people have slipped on wet floors. Luckily, nobody was seriously injured, but you're worried.

You speak to your colleagues, and they all agree that they've got into some bad habits.

You're sure you can fix this without mentioning it to your boss. What solutions can you identify?



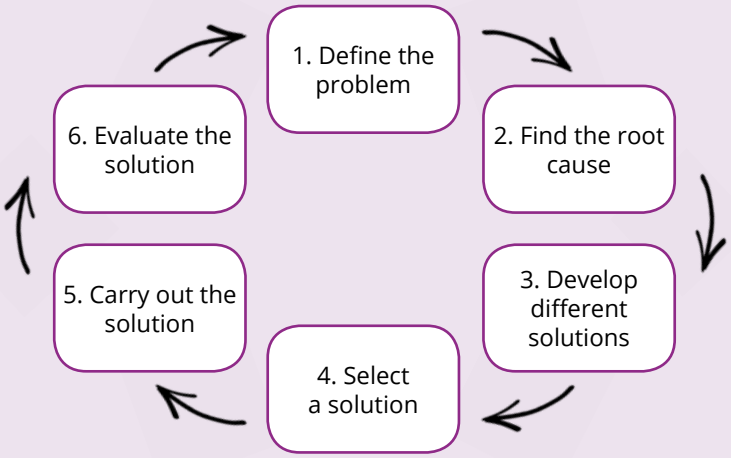
2 See: https://en.wikipedia.org/wiki/Issue_tree

The 6 Step Problem Solving Method[3]

This is a problem solving technique which can be applied to almost any problem, big or small.
With the 5 Whys approach you started to look at the root causes of a problem, but in itself, this isn't enough. You also need to find the appropriate solution.

1. Define the problem.

Before you solve a problem, you need to first understand what the problem actually is. Think about what would happen if you did nothing, and whether the problem needs to be solved now or if it can wait until later. You could also think about who is the best person to solve this problem, and if the responsibility should lie with you or someone else. In thinking through this stage, it can help to write down the problem in simple, easy to understand language.



2. Find the root cause.

In the example on the previous page, we saw that the problem was that the kitchen sink was blocked. However, by using the 5 Why method, we saw that the root cause of the problem was something completely different. A problem, and what causes a problem, is not the same thing. Sometimes you might be able to find more than one root cause of a problem. Once you have identified one or more root causes, you can then test your ideas to see if there is any evidence to support them, or whether you've reached the wrong conclusion.

3. Develop different solutions.

In this stage you should try to think as creatively as possible. Ask other people, or do some research on how others have solved this problem in the past. Use mind-maps or make lists to get your ideas down on paper, or draw your imagined solutions if you're more artistic. You could also imagine the problem being solved, and then work backwards to imagine the different ways it could have been solved. Write down any ideas which come to you, and challenge yourself to think of the most unusual solution you can find. Think about 'what if...?' rather than simply 'what' or 'how'.

4. Select a solution.

Once you have a range of possible solutions, you can then think about the best one. Make two lists and write down the advantages and disadvantages of each solution. Think about what might happen if the problem isn't solved. If money is the most important consideration, then work out the cheapest solution. If time is more of an issue, decide on the quickest solution.

5. Carry out the solution

When you've made a decision on which solution to use, you should then plan each step before starting to solve the problem. Think about how long you might need, and who else needs to be involved. Decide what you need to do, what other people need to do, and make sure that other people understand this, too. Give yourself a time limit, and remind yourself what solving the problem might look like. Decide how you'll know when the problem is solved.

3 See: https://www.linkedin.com/pulse/20140530154920-39527870-6-effective-problem-solving-steps-for-business-and-life-in-general

6. Evaluate the solution

If the problem remains unsolved, or things are actually getting worse, don't carry on with the same solution when it's obviously not working. You might even have to go back to an earlier stage in the cycle and start some of the steps again. If you solve the problem, then you can feel proud of yourself, but don't stop there. Think about why the solution worked, and whether there's anything you would do differently next time. Remember how you solved the problem and remember these lessons in case the problem arises again in the future.

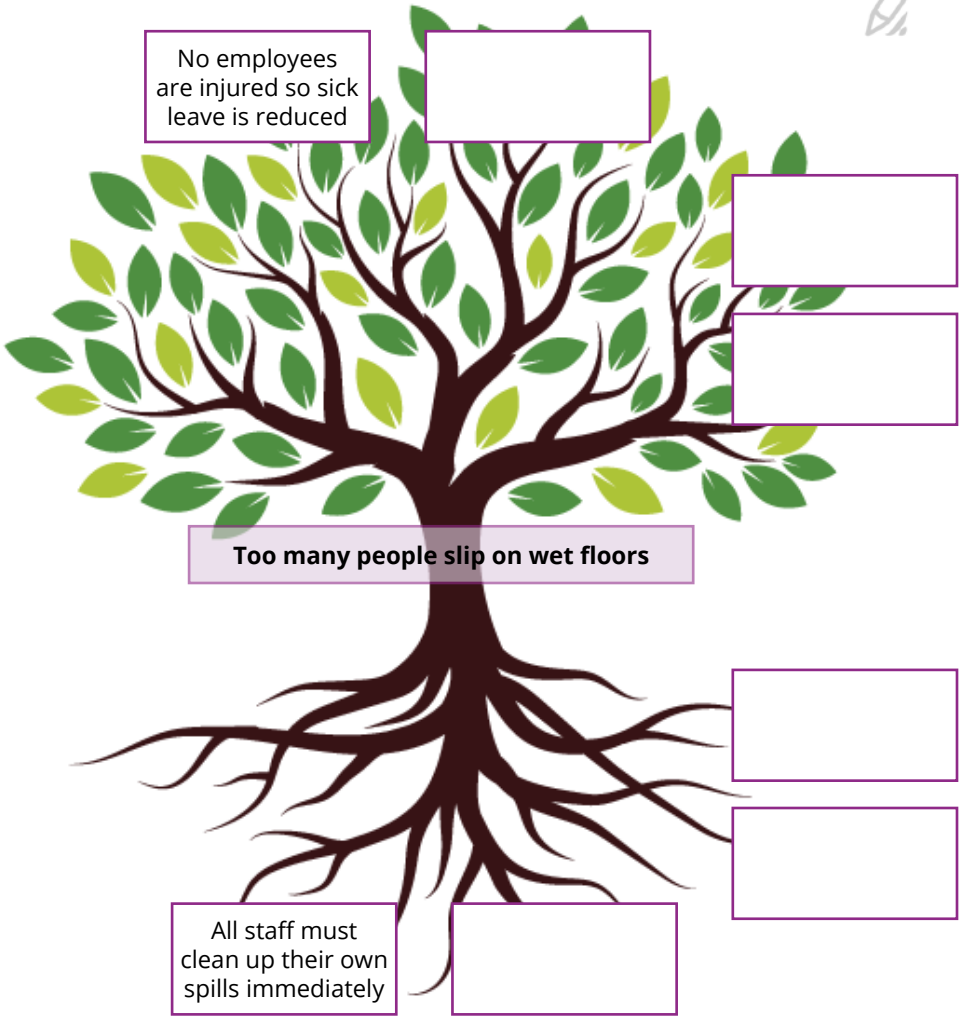
YOUR NOTES

ACTION PLANNING

The Solutions Tree

The problem tree is dying because the roots are unhealthy. By contrast, the solution tree has solutions at its root, and by tackling the problem, its branches and leaves can thrive.

Write down some solutions to replace the root causes, and say what could improve as a result of solving the problem.



What could improve as a result of solving the problem

The problem

The solutions to tackle the root causes of the problem

Think about some key tasks or activities you're going to take part in.

Once you've identified this, identify three problems which could occur at some point.

Problem 1:	Problem 2:	Problem 3:

Choose **one** problem to focus on, if and when it occurs. Use the 6 Step Method to solve the problem. You could also draw your own Problem and Solutions Trees to help you.

1. Define the problem	
2. Find the root cause	
3. Develop different solutions	
4. Select a solution	
5. Carry out the solution	
6. Evaluate the solution	

REFLECTING AND EVALUATING

How did it go? Here's your chance to reflect on how you've improved your problem solving and analytical skills. Fill in each arrow below with your results and thoughts.

What task/activity did you complete?

Did you follow your own advice on problem solving? How?

Can you now solve problems better? How?

What new skills in problem solving and analytical thinking will you take with you and develop further in the future?

AFTER THE JOURNEY – SKILLS CHECK

You've almost completed this stage of your soft skills journey. You've used this part of the journey to think about your problem solving and analytical skills. Now it's time to see how much distance you have travelled in your problem solving and analytical skills journey. Indicate in the spaces which best represents your skills now.

		Emerging		Consolidating	Established	
		Never – I struggle with this	Hardly ever	Sometimes	Usually, but not always	Always – no problem!
	Example: *I see problems as opportunities for development and learning*	1	2	3	4	5
1	I try to find the root causes of problems before launching into finding solutions	1	2	3	4	5
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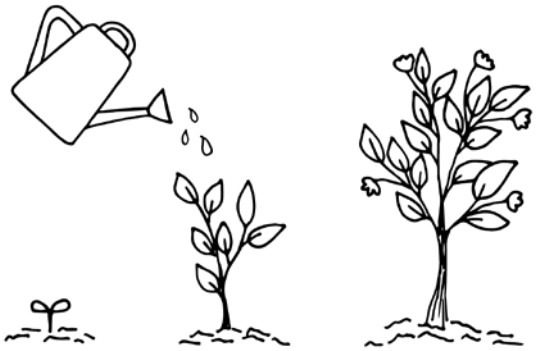
Shade in the box which indicates your overall problem solving skills level.

Overall, my problem solving and analytical skills are:	Emerging	Consolidating	Established



Emerging = your skills are starting to develop.

Consolidating = you're practicing and developing your skills, but you're not quite there yet.

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Again, ask the same person who knows you well to indicate on the chart the spaces which best represent where you're at now. They must not look at your answers!

Peer reflection carried out by: Relationship:		Emerging		Consolidating		Established
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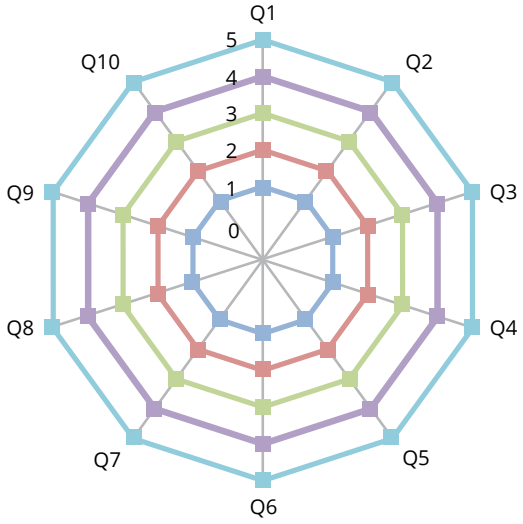
Next, plot your answers on the spider web diagrams below.

If you need more help, look in the **Instructions and Guidance** section for how to do this.

My responses:



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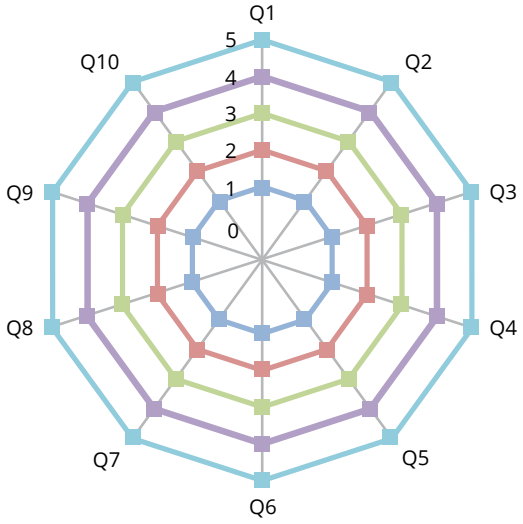
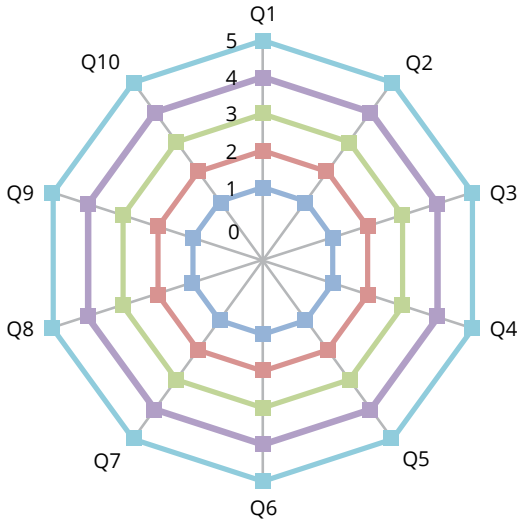


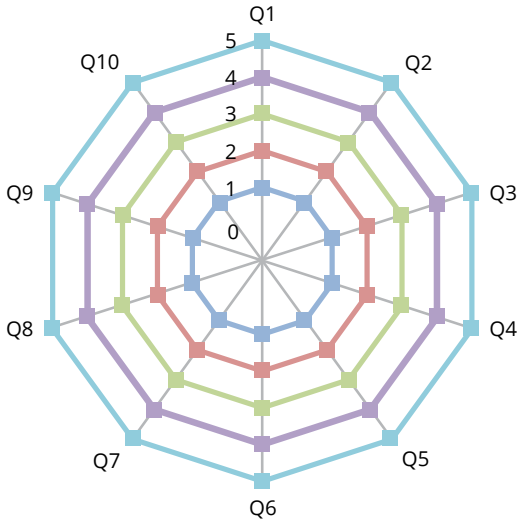
If your spider's webs look the same, that's fine. Go to the next stage.
If they're different, work together to produce a single spider's web you can both agree on.

Plot out two diagrams – your skills before, and your skills now.

My skills before:



My skills now:



Are your 'before' and 'after' diagrams different? How much progress have you made?
If they're the same, don't be disheartened. Sometimes we slip backwards, or we need more time to develop our skills. This is part of the journey!

Remember that the levels are personal to you and reflect your habits, knowledge and experience and cannot be compared with other people who will have different backgrounds.

MOVING ON

This part of the journey is almost over. It's time to prepare for the next stage.

1. How are you going to continue developing your problem solving and analytical skills?

I am going to continue developing my problem solving and analytical skills by:

2. You've applied for a job or training course, and they want to know what experience you have in solving problems and thinking analytically.

What examples can you now give in your written application?

3. They liked your application, and they want to invite you for an interview.

What further examples of good problem solving and analytical thinking skills should you mention in your interview?

You are now ready to move on to your next skill.

ANSWERS:

A.

The last person doesn't take an egg out of the basket, but takes the basket with the egg still in it.

B.

The surgeon is female and is the mother of the injured child.

C.

The woman is much shorter than average and can't reach the buttons to the upper floors. When it's raining, she carries an umbrella and she uses this to press them.

D.

The person is my son!

I don't have any brothers or sisters, so I am my father's son, and I am the father of my son.

My Father - Me - My Son

YOUR NOTES