Ajay is a visualisation programmer

NOT GOOD AT

learning new languages or understanding poetry

LOVES

singing, outdoor sports, bushwalking, camping

CAREER

visualisation programmer

STUDIED

Bachelor in Computer Science
Masters in Mathematics
Ph.D in High Performance Computing

DEVELOPED

an open-source visualisation software named Drishti

EXPERT AT

helping researchers to visualise their scientific data.

GOOD AT

adapting things and running a local radio show

SUPPORTS

effective communication by helping people understand complex data

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www.futureyouaustralia.com.au/pathfinders/ajay

Meet Ajay Limaye

What do you do?
I work as a visualisation programmer at the National Computational Infrastructure, situated in the Australian National University. I help researchers to visualise their scientific data.

How did you get into that job?

During my school and college years I was more interested in biology subjects and actually wanted to do medicine. Unfortunately (or fortunately) I was not able to get into the medical program, because I didn't meet the requirements. Fortunately, I was able to get into the computer science program and did a Bachelor's degree in Computer Science. I got hooked on programming and graphics and knew this was what I wanted to do. I have always been a visual person, attracted towards visual arts, so with my programming skills, gravitating towards scientific visualisation was natural. This was followed by a Masters in Mathematics. After that, I did my Ph.D in High Performance Computing. My Ph.D was mainly about the development of parallel code for quantum chemical calculations. I was able to incorporate visualisation as a part of my thesis by developing visualisation software to visualise chemical structure and properties.

My Ph.D in the field of High Performance Computing, from India, opened up the doors for me in the field of scientific computing. Right after my PH.D I joined as a Computational Chemist at ANU Supercomputer Facility. I have always been interested in computer graphics and visualisation. I had written a molecular visualisation software during my Ph.D days. Luckily for me within a short time after joining ANU, I was able to switch to scientific visualisation.

I moved here way back in 1997. ANU Supercomputer Facility (which morphed into National Computational Infrastructure) turned out to be the right place for me as I was able to interact with researchers from a variety of scientific disciplines. Never thought of leaving the place.

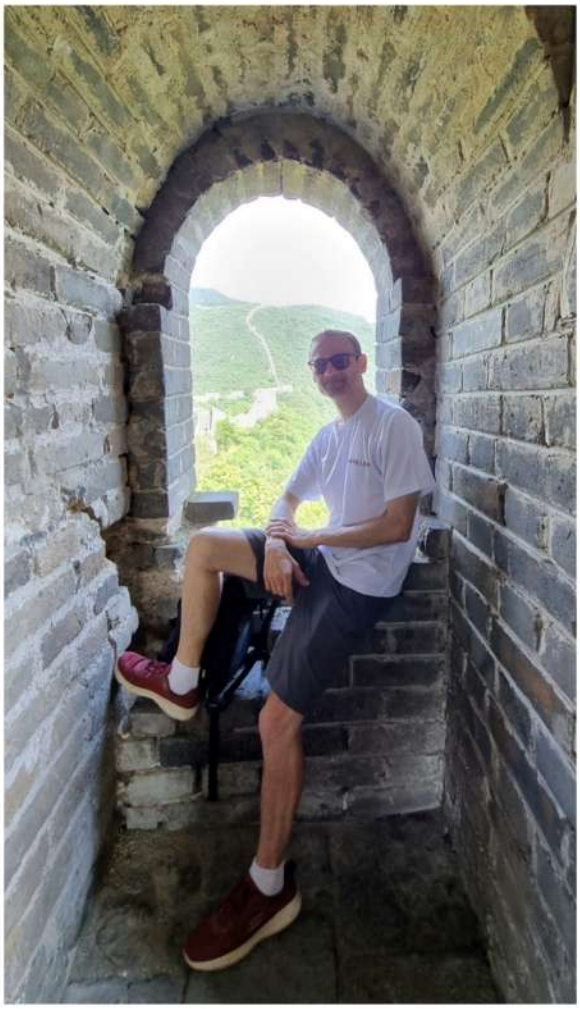
What do you love about your job?
3D visualisation of complex 3D data sets is now essential to the analysis of the high-resolution data sets that underpin modern research including, but not limited to, medicine, materials, biological, earth and physical sciences. It is also central to effective communication through project teams, stakeholders and wider audiences dealing with global issues at all scales. My work in visualisation has allowed me to work and collaborate with researchers from a wide variety of disciplines.

How does your job help people/the community/the world?
I have developed an open-source visualisation software named *Drishti* (this word in Sanskrit, stands for cognition/insight/vision depending on context). *Drishti* has been employed in a wide variety of research fields. These include, but are not limited to, material science, paleontology, medical research, plant science, forestry, archaeology, anthropology, mining, geology, marine sciences, bioengineering, and nano research – essentially all those where volumetric data is generated. Apart from research activities, *Drishti* has been employed to augment teaching as well as in public engagement activities in documentaries and museums.

What are two things you're not good at?

Languages – Computer languages are fine. Learning a new human language, apart from those that I have already learned during my school years, is a bit of an uphill task.

Poetry – I get the gist, but as far as touching the heart goes, I'm still waiting.



What are two things you are good at?
Employing and adapting stuff from disparate areas to suit the current situation. This is one of the reasons, I enjoy working in visualisation. This is an applied area that is needed by almost everyone. I can employ things that were learnt from a different field in a new way.

I have been involved in sharing science in our small community (of Marathi speaking people here in Canberra). I have run a local radio show delving into a variety of science-related topics. Recently I have started an initiative to increase collective awareness amongst community members regarding a variety of subjects. I host a talk show every couple of months at my house by experts in different fields for the benefit of the community. The subject matter is not restricted to science and technology.

What makes you happy (outside of work)?
I enjoy singing, outdoor sports, bushwalking, and camping.

Where do you want your career to take you?
Luckily, I am perfectly placed where I am – working and collaborating with researchers from a wide variety of disciplines.

Joins computer club at school

Bachelor of Computer Science

Does independent online study of programming languages

Undertakes professional development opportunities in various visualisation fields

Finish Year 12

Summer internship at university analysing data

Junior visualisation programmer at National Computational Infrastructure (NCI)

Promoted to visualisation programmer

Finish Year 12

Does free micro-credential course online - Introduction to Data Analytics

Undertakes further data storytelling courses online - still working in retail

Applies for role as junior business analyst in a bank

Build portfolio of data visualisation projects

Works in retail while trying to figure out next steps

Sparks interest in interactive data visualisation tools

Does 3-month paid business analyst internship at Amazon

Collaborates on data visualisation projects to build skills

Headhunted on Linked In to become data visualisation programmer for big retailer

Finish Year 10

Get injured - assigned to desk work for a while

Sees opportunities to optimise website - becomes passionate about coding

Creates personal projects to build portfolio

Approached to undertake freelance work to create visualisations

Applies for full-time role as visualisation programmer with CSIRO

Starts Carpentry Apprenticeship

Due to coding knowledge learned at school does website updates

Independently learns programming languages and does online coding courses

Collaborates with open-source communities via RocketChat

Continues to refine skills and knowledge

Visualisation programmer career pathways

Find out more at www.futureyouaustralia.com.au/resources/#other/

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The educational qualifications and levels outlined in these pathways are intended as general guidelines. To obtain accurate and up-to-date information, explore resources specific to your state or territory, available through websites like *myfuture.edu.au*, *YourCareer.gov.au* and *australianapprenticeships.gov.au*.

There is also a range of financial support available for students doing apprenticeships or going to university, visit *www.servicesaustralia.gov.au/education* to see what's available.

- Bachelor of Computer Science: https://www.courseseeker.edu.au/
- Summer internship: https://www.linkedin.com/jobs/data-analyst-intern-jobs/
- Programming languages: https://www.coursera.org/courses?query=programming%20languages

- Introduction to Data Analytics: https://store.training.tafensw.edu.au/product/introduction-to-data-analytics/
- Coding course: https://info.coderacademy.edu.au/web-dev-info-session
- Business analyst internship : https://au.prosple.com/

- Carpentry Apprenticeship: https://www.aapathways.com.au/industry-specific/carpentry or https://www.yourcareer.gov.au/occupations/3312/carpenter-and-joiner
- Coding course: https://info.coderacademy.edu.au/web-dev-info-session
- Programming languages: https://www.coursera.org/courses?query=programming%20languages

SCAN ME

Remember, there are countless pathways to the same career. Each child's unique skills, interests, and strengths will guide them on their personal journey to success.

Comprehension Questions

Australian Curriculum V9.0 links for Years 3 to 7

English
- Literacy

General Capabilities:
- Literacy

Learning outcomes:

All students will be able to:
- Identify that all people have strengths and weaknesses
- Actively think about what is happening in various texts as they read them
- Apply comprehension strategies to different media formats

In addition, some students will be able to:
- Identify different reasons for doing different jobs

Instructions:

- Format/print the students' question sheets (or load them onto school LMS) and direct students to a copy.
- Read the questions as a class to start, discussing any meanings
- Discuss with the class strategies for being able to answer the questions as they read about Ajay
- Read about Ajay as a class, encouraging students to answer questions as you go

Adaptation note: Questions can be modified on the PDF to meet students' needs or learning focus areas in your classroom

Comprehension questions

1. What does Ajay do and where does he work?
2. What did Ajay want to study during school and college?
3. How did Ajay incorporate visualisation into his thesis?
4. When did Ajay move to Australia?
5. What two things is Ajay not good at?
6. Name two things Ajay is good at.
7. What does Drishti mean?
8. What does Ajay's work allow him to do?

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Answers:
1. He's a visualisation programmer at the National Computational Infrastructure, situated in the Australian National University.
2. Medicine
3. By developing visualisation software to visualise chemical structure and properties
4. In 1997
5. Languages (aside from programming) and poetry
6. Employing and adapting things, and running a local radio show
7. Cognition/insight/vision
8. To work and collaborate with researchers from wide variety of disciplines

Ajay

Student name:

Comprehension Questions

What does Ajay do and where does he work?

What two things is Ajay not good at?

1.

2.

What did Ajay want to study during school and college?

Name two things Ajay is good at.

1.

2.

What does Drishti mean?

How did Ajay incorporate visualisation into his thesis?

What does Ajay's work allow him to do?

When did Ajay move to Australia?

Capability Convos

Australian Curriculum V9.0 links for Years 3 to 7

English
- Language
- Literacy

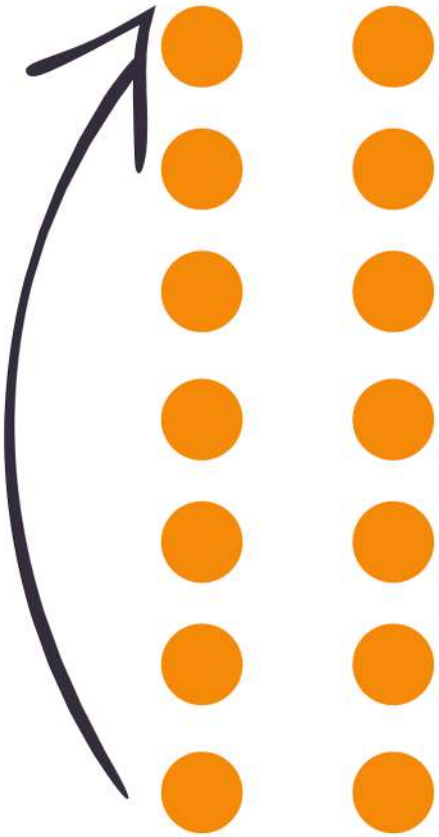
General Capabilities:
- Critical and Creative Thinking
- Personal and Social Capability
- Ethical Understanding
- Literacy

Learning outcomes:

All students will be able to:
- identify some likes, dislikes, strengths, abilities and/or interests when showing a personal preference
- acknowledge that people have different needs, emotions and abilities

In addition, some students will be able to:
- describe the ways they are connected and can contribute to their community groups

Format
- Interactive game with 10 questions
- Easy to play
- Read about Ajay's job and journey with the class
- Print the questions
- Play the game
- Modify or include new questions based on students' needs



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Instructions for students

Line the class up in two lines facing each other to form pairs. Ask the first question. Once each pair has discussed it, get one line to move one person to their right. The person at the end runs around to the other end of the line. Then you ask the next question and repeat the process until all the questions have been asked.

Ajay
Visualisation Programmer

Question 1
What do you think is interesting about Ajay's career?

Question 2
What skills does Ajay have that you also have, and does he have any skills you don't have that you would like to have?

Question 3
Why do you think it's important to find a career that suits your skills and personality?

Question 4
How are your interests and hobbies similar or different to Ajay's career?

Question 5
How do you think Ajay's career contributes to society?

Question 6
What sort of problems do you think Ajay might have doing this job in a rural or remote location?

Question 7
How important are mathematics and engineering in Ajay's job? Can you think of some examples?

Question 8
What tools or technology do you think Ajay needs to do his job?

Question 9
How do you think AI might change Ajay's job in the future? Can you think of some examples?

Question 10
What do you think would be the biggest challenge pursuing a career as a visualisation programmer?

Visualisation Programmer

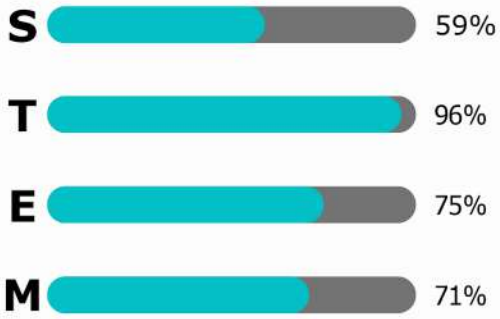
Ajay is a visualisation programmer who developed a software program that makes complex data easy to understand. It turns huge amounts of complicated information into a clear story. Ajay also hosts a local radio show for his community where he delves into science-related topics. Find out more:

futureyouaustralia.com.au/pathfinders/ajay

"I have always been a visual person, attracted towards visual arts"

STEM Meter

How much Science, Technology, Engineering and Mathematics (STEM) does this job use?



Source: jobsandskills.gov.au

5 reasons why you should do this job

1. Bring imagination to life
2. Help scientists solve mysteries
3. Make learning fun
4. Tell stories in a new way
5. Help people see the big picture

3 STEM skills required for this job	Subjects to develop these skills
Programming	Digital Technology, Mathematics
Complex Problem Solving	Design and Technologies, Digital Technology
Mathematics	Mathematics

A example of a day in the life of a visualisation programmer

6.30am It's an early start for me today. I like to embrace the morning with a nutritious breakfast to fuel my creativity. I normally opt for a quick and energizing meal, so today I have a smoothie packed with fruits and greens.

7.00am I slide into my workday attire – today I choose some tailored pants and a collared shirt, something comfortable yet professional.

8.00am I jump in the car. It's a short drive to work for me and I use this time to mentally prepare for the day ahead by listening to my favourite podcast.

8.30am We started each day with a Team Sync-Up. This is a virtual team meeting where we discuss ongoing projects, share updates, and align our priorities. Collaboration is key, and this is a valuable chance to connect with my colleagues and set the tone for the day.

9.00am Now, it's time to code. I get to work on data visualisations, tweaking designs, and ensuring a seamless user experience. My focus today is keeping the code active and precise – every line of code should contribute to the bigger picture.

12.30pm I take a well-deserved break to recharge and head out with some of my colleagues to try a new local eatery. I make the most of my lunch break and always step away from the screen. This is an important opportunity for me to refresh my mind, and prepare for the afternoon tasks.

1.30pm I've got an important appointment this afternoon with a client. I'm going to provide progress updates on an ongoing project, address any concerns, and gather feedback. I make sure I have an agenda. This helps keep the conversation clear and client-focused, ensuring they understand the value I'm bringing to their visualisation needs.

2.30pm Time for some fun! I'm engaging in a collaborative session with UI/UX designers and fellow programmers. We're going to share ideas, troubleshoot challenges, and brainstorm innovative solutions. I grab a banana because I need to keep my energy high during these discussions.

4.00pm I allocate a block of time for uninterrupted work every day. This is my chance to delve into complex coding tasks or refine intricate design details.

6.00pm I wind down for the day by reviewing my progress and ensuring everything is on track. I'll make a to-do list for tomorrow so I can hit the ground running in the morning.

7.00pm I get home and engage in activities that relax my mind. I make sure I prioritise creating a healthy balance between work and personal life. It makes me happier and better at what I do. Tonight I'm planning on doing some cooking - I love everything visual and that also applies to food.

10.00pm YUM! That was delicious. The clean-up was a bit overwhelming but you can't make magic without making a mess. Once the kitchen is clean I head to bed and spend some time scrolling social media before going to sleep. I follow lots of art pages, so it's a guilty pleasure of mine.

Visualisation Programmer

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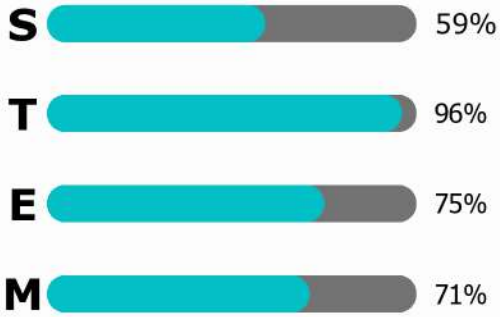
"I have always been a visual person, attracted towards visual arts"

STEM Meter

How much Science, Technology, Engineering and Mathematics (STEM) does this job use?



Source: jobsandskills.gov.au

Job stats and facts

Future job growth: Over the next five years jobs in this field are expected to grow very strongly.

Location: 11% of visualisation programmers live outside capital cities.

Employment pathways: A bachelor degree or a VET qualification in a related field is required.

3 STEM skills required for this job	Subjects to develop these skills	3 other jobs that value this skill
Programming	Digital Technology, Mathematics	App developer, Database administrator, Systems analyst
Complex Problem Solving	Design and Technologies, Digital Technology	Police officer, Chemist,Geologist
Mathematics	Mathematics	Accountant, Teacher, Animator

Other careers related to this line of work

Health

Healthcare Data Analyst
Medical Informatics Specialist
Epidemiologist
Biostatistician
Health IT Project Manager

Education

Data Science Educator
Educational Technology Specialist
Data Literacy Trainer
Online Course Developer
Visualisation Curriculum Designer

Leadership

Data Science Manager
Chief Data Officer
Analytics Director
Business Intelligence Manager
Technology Director

People

User Experience Designer
Customer Insights Analyst
Market Research Analyst
Social Media Analyst
Human Resources Analytics Specialist

Environment

Geospatial Analyst
Environmental Data Scientist
Geographic Information System Specialist
Climate Data Analyst
Sustainability Analyst

The world is changing rapidly, and this means the career possibilities available to our kids are wide-ranging and exciting (and probably, don't exist yet!).

From traditional vocations to emerging fields, there are countless pathways to be explored.

Parents and teachers can create environments that encourage kids to discover and investigate possible careers that match their skills and interests.

We've included some links to other valuable resources that can help guide career conversations and explorations. Find out more at:

www.futureyouaustralia.com.au/resources/other

Pathfinder Workwords

Visualisation Programmer

M G O Q H R J X J I V K R J O M Y R C Y V I A
S N R L D S U T C M L Q W Y W V J E Q G C Y L
B I E G B P D C D S Z T Y S I Z C C H O T N G
L D N Y N H R C H E O I P S I N V K Z I V Y O
B O D T N I X G E Q M F U N E M I U L S T L R
G C E Z A U M A N I M A T I O N U A E I B S I
H N R M D V G M Y I L Q R W T S E L V A C D T
J N I M Q R V X A I G E N E A R X I A I A W H
F M N L O S A T S R P G R D L R T M H T X R M
O K G V E A T A D X G F U A G A E P U A I S S
N G I S E D T X E V A O U B E D A N C R K O G
Z E T U J I O R T C Z T R R E R W V D M Z Z N
A W R K O Y E M E C R A C P G D U B R U G D O
D Y R N T S O D D I U S E R I N T E R F A C E
S R Y I U Z R O V I N T E R A C T I V E L H V
Y T I L A E R D E T N E M G U A X L H Z Z R R

Find 20 words Ajay needs to do his job.

1. PROGRAMMING
2. CODING
3. GRAPHICS
4. ANIMATION
5. SOFTWARE
6. ALGORITHMS
7. VISUALISATION
8. DESIGN
9. 3D MODELING
10. VIRTUAL REALITY
11. USER INTERFACE
12. SIMULATION
13. RENDERING
14. INTERFACE
15. DATA
16. USER EXPERIENCE
17. INTERACTIVE
18. AUGMENTED REALITY
19. DEBUGGING
20. CREATIVITY

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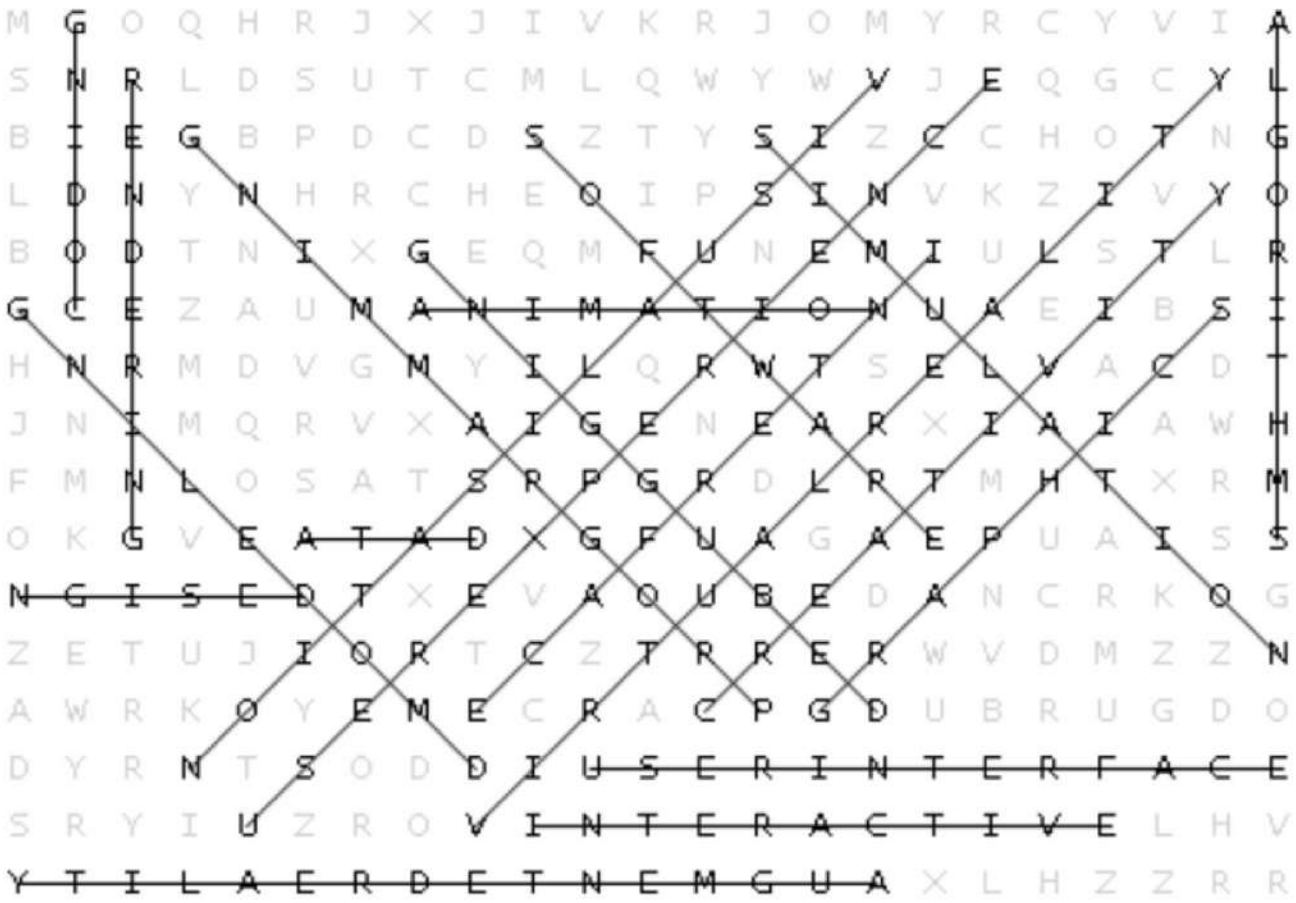
Pathfinder Workwords

Answers



Let's reflect

Were any of these words new to you? Look them up and find out what they mean.

Which of these skills do you think you are best at, or would like to get better at?

1._____

2._____

3._____

Can you think of anything else Ajay might need to do his job?

_____

Meet Ajay. He's a visualisation programmer who takes complex data and turns it into easy-to-understand visuals. Fill in the bubbles with 5 STEM (Science, Technology, Engineering and Mathematics) skills he uses in her job. Which of these skills do you think is most important? Which do you think would be the hardest to develop? When you've thought of the skills, colour in the rest of the image.