



Cambridge International AS Level

ENGLISH GENERAL PAPER

8021/22

Paper 2 Comprehension

May/June 2025

INSERT

1 hour 45 minutes



INFORMATION

- This insert contains all the resources referred to in the questions.
- You may annotate this insert and use the blank spaces for planning. **Do not write your answers** on the insert.

This document has **8** pages. Any blank pages are indicated.

Material for Section A

Background

Tony and Paula Larsen are planning to send their children, Zendy (aged 17) and Julian (aged 15), to a summer camp. They have brochures for three activity camps.

Camp Imagi

Founded in 1980, Camp Imagi is a vibrant summer school which specialises in sparking the imagination of teenagers through the arts. We have weekly programmes filled with a variety of artistic activities including art, drama, dance, filmmaking, music, photography, singing and writing for novices, with visiting professional artists.

At Camp Imagi we have art studios, stages, dance studios, music rooms, recording studios with the latest software, and a dark room for processing photographs and prints. Every day the young people are working towards a final day of exhibitions, presentations and performances of their creations from their time at Camp Imagi.

Young and enthusiastic tutors focus on your child's participation in activities, providing a welcoming learning environment. Small class sizes enable tutors to personalise the learning, so they can guide, motivate and encourage your child to achieve their full potential.

Guest instructors provide workshops throughout the week to expand your child's knowledge of the arts. Our summer camp looks to develop young people's creative skills whilst having fun.

Embrace your artistic side and join our creative community now!

Camp Venchure

Are you ready to push yourself beyond your limits? Grab your bags and join us in the great outdoors at Camp Venchure! This is a unique summer camp where 14- to 16-year-old thrill-seekers participate in challenging and demanding adventure sports whilst gaining invaluable life skills.

Our weekly courses are jam-packed with adrenaline-filled activities which test your physical boundaries and require nerves of steel, as well as a good sense of balance. Our specialist instructors provide safety briefings and prepare young people to push their physical boundaries in the following activities: abseiling, archery, kayaking, mountain biking, rock climbing and the ultimate Venchure high ropes course, which includes monkey bridges, free-fall swings and rope tunnels rising to 16 metres above the ground, culminating in a zip wire to whisk you down to the finish line.

By joining our residential camp, young people increase their independence in a safe environment. Our qualified staff encourage camp members to improve their physical fitness and resilience, and develop your child's teamwork and problem-solving skills. Our instructors are on hand around the clock to engage and encourage your child through exhilarating personal quests.

Why not check our website for further details?

Camp Anim8

Situated in the heart of a forest on a private estate, Camp Anim8 is celebrating its fiftieth anniversary as one of the leading providers of international summer camps. Every summer we welcome 1000 students from 25 countries to our fun-filled camp to enjoy activities, whether they are staying with host families or attending on a daily basis.

Our international students spend the mornings in English lessons, whilst English speakers attend foreign language lessons. In the afternoons, everyone has the opportunity to participate in the following activities: visits to museums and historic buildings, themed treasure hunts and traditional cooking demonstrations with food tasting. Your stay culminates in a day celebrating international culture.

Camp Anim8 is based on family values. We have a dedicated welfare team available 24 hours a day to support your child, together with a well-being room, where your child can access a member of the team for a chat.

Our mission statement: we aim to bring global citizens together to strengthen international bonds.

Additional Information

- 1 Zendy and Julian Larsen are very close, so they want to attend the same summer camp.
- 2 Julian climbed up a high cliff at the beach when he was younger and had to be rescued.
- 3 Zendy has a canoeing award as a proficient paddler.
- 4 The mountain biking instructor at Camp Venchure is unable to work due to an injury caused by a faulty bike and he is now taking legal action against his employers.
- 5 Paula is concerned about health and safety in summer camps, after reading several negative newspaper articles about this.
- 6 Julian, who has performed in several school plays, is a talented actor and would like to pursue a career in acting.
- 7 Camp Imagi is open on weekdays from 08:00 to 16:00.
- 8 Many online reviews for Camp Venchure describe the experience as mentally and physically exhausting.
- 9 Zendy has been learning to play the guitar for eight years and she has started songwriting, as she is thinking of studying music performance at university.
- 10 At the weekend, Julian likes to go cycling with his friends.
- 11 The family lives 20 km from Camp Anim8, 50 km from Camp Imagi and 75 km from Camp Venchure.
- 12 Paula and Tony compete in amateur tennis tournaments as a doubles pair.
- 13 As she is very adventurous, Zendy went on a tandem skydiving experience for her sixteenth birthday.
- 14 Tony would like Zendy and Julian to spend more time outdoors at the summer camp.
- 15 Zendy would like to attend a residential camp.
- 16 As Tony grew up in Spain, Julian and Zendy enjoy speaking Spanish when they visit their father's Spanish side of the family.
- 17 Last year, Ines, Zendy's best friend, attended Camp Venchure. Ines told Zendy that she had been woken up by the instructors at 05:30 every morning to go running.
- 18 Tony commutes to work and leaves the house at 07:00 and gets home at 19:00. Paula is a doctor who works in the local surgery from 09:00 until 17:00.
- 19 The guest instructor for photography at Camp Imagi has accepted a last-minute commission to take pictures of wildlife in Kenya for a prestigious magazine.
- 20 Julian suffered homesickness on a recent school trip.

Material for Section B

An article by Christine Ro.

Why robotic worms could one day dig beneath your feet

For decades, scientists have been developing soft robots inspired by a creature often taken for granted – the humble earthworm¹.

Though specific features will vary by species, many earthworms are excellent burrowers, and can bend with ease. ‘They are very flexible and move through spaces that might be difficult to access,’ comments Elsa Arrázola-Vásquez, who researches soil management at the Swedish University of Agricultural Sciences. In other words, earthworms can do things that many machines still cannot. 5

The progress in replicating these functions robotically has been slow but steady. There have been innovations in mimicking earthworm setae (bristles), which help worms to anchor. Plus, there’s been progress copying the fluid in their segments which, among other functions, help them to move. Capturing the distinctive movement of the earthworm is the latest advance. In the Soft Robotics group at the Italian Institute of Technology (IIT), researchers have developed a robot that essentially bulges in and out at the sides while it stretches and contracts in length. This design is novel, according to Riddhi Das, a mechanical engineer at IIT, as it uses positive and negative pressure to generate force which is directed outwards and along the length of the robotic worm. 10 15

The innovation means his creation more closely represents how an earthworm’s muscles move, and allows for more varied movement. His earthworm robot is about the length and weight of a light dumbbell². It’s filled with gel which allows the researchers to better approximate the earthworm’s radial³ movements, compared to other types of liquid. And though it’s not as fast on a flat surface as some previous designs, it’s able to move deeper through artificial soil. 20

One person who knows how hard it is to build an earthworm-type robot that can burrow is Yasemin Ozkan-Aydin, an electrical engineer at the University of Notre Dame in the USA. She has worked on four earthworm robot designs, drawing on observations of real earthworms. She says the IIT group’s innovation is ‘very important’ in the world of robotics, as each segment of their earthworm robot has the capability to expand in two directions. That allows it to create an earthworm-type locomotion, which is like a wave of contraction and expansion that moves along its body. 25

Like the other projects in her lab at IIT, this is genuinely bioinspired, says biologist-turned-roboticist Barbara Mazzolai. This means that developing the prototype required a fundamental understanding of earthworm biology, rather than just mimicking its shape. Those biological principles had to bring some useful function to the robot. In the case of bioinspired earthworm robots, one useful aspect to replicate is an earthworm’s soft yet strong structure. 30

One key difference remains the size. With a diameter of 4 cm and a length of 45 cm, the IIT robot is considerably larger than an actual earthworm. Also, earthworm robots typically have pumps or other systems for movement that add to their bulk. This limits the potential applications in endoscopy (the use of tubes to examine internal organs). Still, this robot isn’t as big as the rugged tunnelling robot created by the multinational company General Electric (GE), one of the few earthworm robots being developed for imminent commercial applications. It’s a self-propelling, extremely flexible, highly steerable robot, according to Deepak Trivedi, a mechanical engineer at GE Research. ‘If you look at the basic building blocks of these robots, these are pneumatic artificial muscles, which are essentially rubber with a cleverly designed fibre net around it,’ Mr Trivedi explains. 35 40

This line of research was inspired by a call for tactical tunnelling solutions from the Defense Advanced Research Projects Agency (DARPA) in the US. ‘Earthworms can do this tunnelling in a very stealthy way,’ Mr Trivedi points out. While that DARPA programme has now ended, GE is continuing to work with the US Department of Defense on specific uses in tunnelling and navigating.

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They are also seeking out commercial clients. Their robot, which has a diameter of about 10 cm, is unusual in being able to create its own tunnels and having been tested in real soil of different types.

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The GE researchers believe that it would be useful for installing underground utility infrastructure, in a less environmentally damaging manner than some conventional drilling. They’re aiming for a lower cost as well. ‘We see a real commercial opportunity for this,’ says John Lizzi, who leads the Robotics and Autonomous Systems division at GE Research. He believes key areas include fibre internet, electrical power and charging infrastructure for electric vehicles. However, GE is limited in what it can publish and publicly disclose about this research, given the military funding. And, of course, not every roboticist wants to work towards military applications.

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Apart from those, earthworm-like robots could also eventually be applied in areas like mining, agricultural sensing, and planetary excavation. An especially important use could be in search-and-rescue operations. Professor Ozkan-Aydin talks of the recent earthquakes that devastated Turkey, her country of origin. A tiny wriggling robot with a camera attached could have been useful there for determining where to concentrate rescue efforts, without disturbing the ground. However, plenty of research will need to be done first.

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If these earthworm-inspired robots do eventually reach a market, they could someday be tunnelling away beneath our feet, helping to lay down the equipment that keeps our societies functioning.

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¹**earthworm:** a creature with no backbone that lives worldwide in moist soil

²**dumbbell:** a short bar with a weight at each end, used typically in pairs for exercise or muscle-building

³**radial:** spreading out from a central point

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