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# Natural Science Olympiad
# GRADE 7

**DATE:** 27 AUGUST 2025

**TIME:** 90 MINUTES

**INSTRUCTIONS:**

1. This booklet has 50 multiple-choice questions.
2. Each question is followed by answers marked A, B, C, and D. Only one answer is correct. Choose the correct answer and shade the corresponding circle on the answer sheet.
3. All working details must be done in the space provided.
4. Calculators are permitted.
5. Diagrams are not necessarily drawn to scale.
6. Each question carries one mark.
7. You have 90 minutes for the paper, which works out to an average of 1.8 minutes per question.
8. Read the questions carefully before answering.
9. Visit the website: www.saolympiads.co.za.

ENJOY THE OLYMPIAD.

## Grade 7 NS Olympiad 2025

Various options are provided to answer the following questions. Choose the correct answer and indicate the correct answer by circling the correct letter on the answer sheet provided.
E.g., 1.1.1 – (A) (see guide)

1. The image below shows a tree in two different conditions: summer and winter. How does the change in seasons impact the biosphere?

A Animals hibernating during summer.
B Decomposers are more active in winter.
C Plant growth slows down in winter.
D Producers stop photosynthesis completely in winter. (1)

2. A scientist is studying two forests: one with many species of plants and animals, and another with only a few. What can the scientists conclude about the forest with more species?

A It is less stable because it has too many species.
B It has greater biodiversity, which makes is more resilient to change?
C It has lower biodiversity because it has more competition.
D It is likely to collapse if one species is removed? (1)

3. Which of the following is INCORRECT with regards to naming a chimpanzee (using the five Kingdom classifications)?

A Phylum: Chordata
B Class: Mammal
C Order: Primates
D Genus: Chimpanza (1)

4. Which of the following characteristics is unique to mammals and helps distinguish them from other animals?

A They lay eggs to reproduce.
B They have feathers for insulation.
C They have mammalian glands.
D They are born alive. (1)

5. Which ONE of the following is an example of an reptile? (1)

| A | B | C | D |
|---|---|---|---|
| | | | |

6. Which of the following features is found only in flowering plants?

A Roots and stems
B Seeds enclosed in fruits
C Undergoes photosynthesis
D Reproduction using spores (1)

7. The following table compares two plants groups: mosses and gymnosperms. Which statement is correct about mosses?

| Feature | Mosses | Gymnosperms |
|---|---|---|
| Methods of reproduction | Spores | Seeds |
| Vascular tissue | No | Yes |

A Mosses have seeds but no vascular tissue.
B Mosses have no seeds or vascular tissue.
C Mosses use seeds for reproduction and have vascular tissue.
D Mosses are vascular plants but do not have seeds. (1)

8. Some plants, like tomatoes, require “buzz pollination”. What does this mean?

A Pollinators must vibrate the flower to release pollen.
B Pollinators are attracted by a loud buzzing sound.
C Pollinators happens at night when bees are resting.
D Pollinators carry the seeds to new locations. (1)

9. The squirting cucumber (*Ecballium elaterium*) is a plant that uses an interesting method to disperse its seeds. What happens when the fruit of the squirting cucumber ripens?

A The fruit turns into a sweet edible treat for animals.
B The fruit explodes, shooting seeds and water several meters away.
C The fruit turns into a bright flower to attract pollinators
D The fruit remains intact, falling to the ground to germinate (1)

https://www.dreamstime.com/photos-images/squirting-cucumber-plant.html

10. Which of the following is products is NOT used for and during menstruation? (1)

| A | B | C | D |
|---|---|---|---|
| | | | |

11. Which of the following contraceptives is a permanent method of contraception?

A Male condom
B Vasectomy
C Contraceptive injections
D Female diaphragm device (1)

12. In the *Bluey* animated series, the characters Bluey and Bingo are sisters with different physical traits. While Bluey has blue fur and Bingo has orange fur, both inherit their traits from their parents, Bandit and Chilli. Which of the following best explains how Bluey and Bingo can have different fur colours despite being siblings?

A. They inherit the same genes from both parents, but Bluey's genes are stronger.
B. Their different fur colors are due to random mutations in their DNA.
C. They inherit different combinations of genes from their parents, leading to genetic variation.
D. Bluey's fur color is determined by environmental factors, not genetics. (1)

https://dtfdallas.com/products/bluey-family-design-dtf-ready-to-press

13. You are designing a new water bottle to take with you on outdoor hiking trips. The water bottle will be exposed to different weather conditions, such as heat, cold, and occasional drops. Which property of material should you focus on to ensure the bottle remains functional and lasts throughout the trip?

A durable
B large capacity
C heat resistant
D lightweight (1)

*Used the following information for question 14 and 15.*
With the rapid increase in the popularity of reusable water bottles and cups, the brand "Stanley Cups" has seen a rise in annual sales to $750 million (over 15 billion rands).

**The cool girls have already moved on from Stanley Cups to a different massive water bottle**

Samantha Grindell and Libby Torres Jan 2, 2024, 12:17 PM ET

Share | Read in app

Courtesy of Stanley/Amazon

- **Stanley Cups have become massively popular thanks to social media and buzzy collabs.**

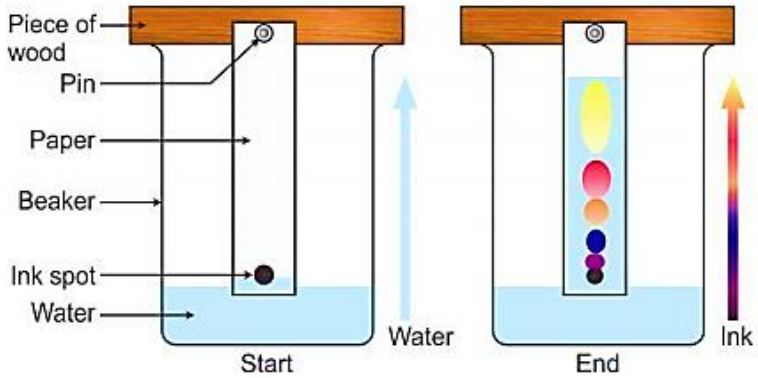
14. While plastic water bottles are designed to be durable and long-lasting, what environmental issue is caused by this property of plastic?

A Increases carbon footprint
B Improve recycling efficiency
C Waste accumulation
D Improves soil fertility (1)

15. The Stanley drinking cup is popular for its durability and its ability to maintain the temperature of drinks for long periods. Which material property plays the most crucial role in helping the cup keep the drink hot or cold?

A High thermal conductivity
B Low thermal conductivity
C High electrical conductivity
D Flexibility (1)

*Used the following experiment and its results for question 16 and 17.*



16. The diagram on the pervious page illustrates _____ separation.

A Distillation
B Evaporation
C Chromatography
D Filtration (1)

17. The purpose of the experiment illustrated in the diagram is to ....

A. To separate mixtures into their individual components based on differences in solubility or movement through a medium.
B. To measure the temperature of substances in a mixture.
C. To combine different substances into one uniform mixture.
D. To identify the colour of any whiteboard marker. (1)

18. Decanting can be used to …

A separate soil from water
B separate oil from water
C separate iron from soil
D separating plastic from other substances (1)

19. Your teacher asks you to collect acid samples for the school chemical store. The labels have fallen off. What do you do to determine if the samples are acids?

A Taste it
B Rub a little bit between your fingers
C Use an indicator
D Add vinegar and see if it makes bubbles (1)

20. Dentists recommend that a person brush their teeth at least twice a day. What is the purpose of the toothpaste?

A To make your breath smell nice
B Neutralised the alkaline released by the microorganisms in the mouth
C Painting your teeth white
D Neutralises the acids released by the microorganisms in the mouth (1)

21. During the summertime, a bee stings your arm.

Because the sting is very painful, your mom puts bicarbonate of soda on your arm. She did this because ….

A The bicarbonate of soda is an acid and neutralises the sting
B The bicarbonate of soda is course and will scratch the stinger off
C Bicarbonate of soda can be made into a paste so that it can be easily absorbed
D The bicarbonate of soda is a base and it neutralise the sting (1)

22. Which of the following famous scientists is also known as the “father of the modern periodic table”

A Dimitri Mendeleev
B Alfred Nobel
C Heinrich Hertz
D Sir Isack Newton (1)

23. If an element behaves like a non-metal but looks like a metal is called …

A Metal
B Non-metal
C Metalloid
D Noble gas (1)

24. During your Natural Science class, your teacher taught you when working with electricity to always use non-conducting equipment or you switch the main electrical off. Which of the following can be regarded as non-conducting objects?

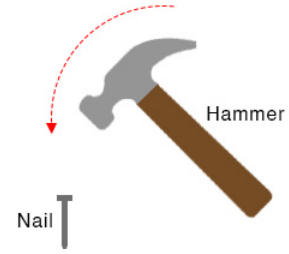
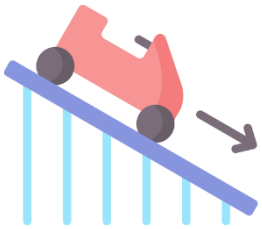
A rubber eraser
B copper wire
C aluminium foil
D graphite pencil lead (1)

25. A windmill water pump is a key aspect in the farming community. What is the windmill's main source of energy?

A Wind
B Water
C Electricity
D Sunlight (1)

https://www.vectorstock.com/royalty-free-vectors/windmill-water-pump-vectors

26. Which ONE of the following is an example of potential energy? (1)

| A | B | C | D |
|---|---|---|---|
|   |  | | |

27. Sometimes energy must be transferred from one system to another. An electric fan transfers it as follows:

A electrical energy in electric circuits→ kinetic energy in fan motor → kinetic energy in fan shaft → electrical energy in fan blades
B kinetic energy in fan motor →electrical energy in electric circuits→ kinetic energy in fan shaft → electrical energy in fan blades
C electrical energy in fan blades → electrical energy in electric circuits → kinetic energy in fan motor → kinetic energy in fan shaft
D kinetic energy in fan motor → electrical energy in electric circuits→ kinetic energy in fan shaft → electrical energy in fan blades (1)

28. What is the standard unit for measuring heat energy?

A Celsius (°C)
B Watt (W)
C Kilograms (kg)
D Joule (J) (1)

29. Which of the following is the best example of energy transfer by convection?

A Heat from the Sun warming the Earth
B A metal spoon getting hot in a pot of boiling water
C Warm air rising and cool air sinking in a room
D A heating pad warming your hands (1)

30. When cooking food, which ONE of the following pot handles would be the warmest to the touch? (1)

| A | B | C | D |
|---|---|---|---|
| | | | |
| wood | plastic | metal | clay |

31. You and your class will be attending a sports event on a sunny day. Which colour shirt will you wear to make sure it absorbs the least amount of radiant energy?

A Purple
B Black
C White
D Blue (1)

32. In the Southern Hemisphere, how should a house be designed to receive the most sunlight during winter?

A With large windows facing north
B With large windows facing south
C By placing solar panels on the west side of the roof
D By painting the roof black to absorb more heat (1)

33. Which of the following unconventional materials has been explored for its insulating properties in experimental or sustainable construction?

A Mycelium (fungus-based material)
B Copper mesh panels
C Glass sheets without air gaps
D Polished steel plates (1)

34. Which natural insulating material is commonly used in traditional Indigenous or native homes to regulate temperature?

A Packed earth or clay walls
B Solid stone slabs without gaps
C Thin bamboo sheets with open airflow
D Metal sheeting without insulation layers (1)

35. When walking, which of the following is the main reason why not all of the body's energy is converted into forward motion?

A Some energy is lost as heat and sound
B The body does not use energy when walking
C All energy is perfectly converted into movement
D The laws of physics do not apply to human movement (1)

36. Study the following picture below.

https://www.vecteezy.com/free-vector/offshore-oil-rig

What is the primary function of the object depicted above?

A Generate electricity
B Harvest oil and gas from sea floor
C Harvest gold from the sea floor
D Create a landing place for helicopters when traveling over the sea.

37. Identify the gibbous shape of the Moon from the following: (1)

| A | B | C | D |
|---|---|---|---|
| | | | |

38. How long is one complete lunar month, from one new moon to the next?

A 28 days
B 29.5 days
C 30 days
D 31 days (1)

39. If it is spring in the Northen Hemisphere, what season is it in the Southern Hemisphere?

A Spring
B Winter
C Summer
D Autum (1)

40. Because of the negative effects of Loadshedding, your school has decided to purchase solar panels. What is the main factor that affects the efficiency of solar panels in generating electricity?

A The colour of the solar panel surface
B The angle and direction at which the panels are installed
C The temperature of the air surrounding the panels
D The type of electrical wiring used in the system (1)

41. In ancient cultures, how were the equinoxes and solstices often used?

A To determine the beginning and end of the farming seasons
B To predict weather patterns for the coming year
C To regulate religious fasting schedules
D To calculate the length of the lunar month (1)

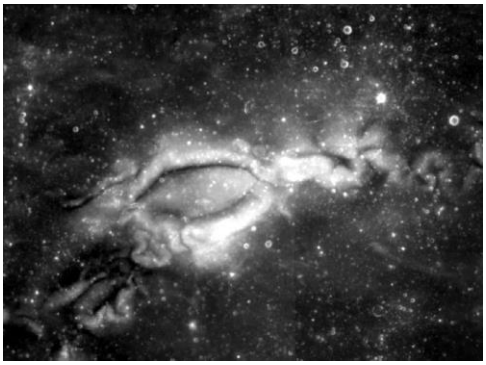
42. Which of the following places receives less sunlight during the day due to its location near the poles?

A The Equator
B Norway during the winter
C Australia in the summer
D Brazil during the rainy season (1)

43. What is the main reason why some countries, like India and South Africa, use a single time zone despite their vast geographical size?

A To simplify communication and coordination across the entire country
B Because they are located very close to the equator
C Because the country has a very small population
D Because their time zone is centred on the equator (1)

44. What is the "lunar swirls" phenomenon on the Moon, and how is it formed?



https://www.jhunewsletter.com/article/2018/09/lunar-swirls-are-remnants-of-moons-geological-past

A Bright, swirling patterns of light created by solar radiation
B Strange magnetic field regions that affect lunar soil, possibly caused by ancient asteroid impacts
C Dark, circular craters formed by volcanic activity
D Rotating dust storms created by the Moon's weak atmosphere (1)

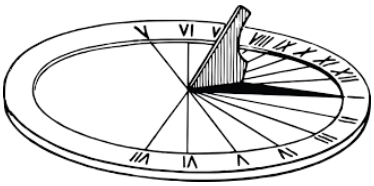
45. Tides on Earth is primarily caused by:

A The rotation of the Earth on its axis
B The gravitational pull of the Moon and the Sun on Earth's oceans
C The Earth's magnetic field affecting the ocean currents
D The distance between the Earth and the stars (1)

46. Calendars have been essential tools for tracking time throughout human history. Different cultures have developed their own methods for measuring days, months, and years How do ancient and modern calendars differ in their approach to measuring a year?

A Ancient calendars were based solely on the lunar phases, while modern calendars use a fixed number of days
B Ancient calendars used both lunar and solar cycles, while modern calendars rely only on the lunar cycle
C Ancient calendars followed the Earth's elliptical orbit, while modern calendars follow a strict 365-day cycle
D Ancient calendars had no system for tracking years, while modern calendars have a clear year-counting system (1)

47. Identify the following instrument.



https://free.clipartof.com/details/1172-Free-Clipart-Of-A-Sun-Dial

A Weather dial
B Telescope
C Electroscope
D Sundial (1)

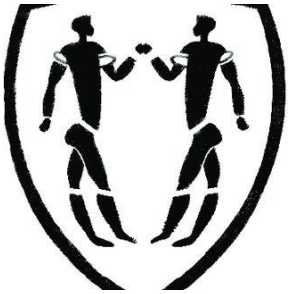
48. What is the significance of the Nabta Playa stone circle in Egypt?

https://en.wikipedia.org/wiki/Nabta_Playa

A It was a site for ancient religious rituals related to the sun and stars
B It was an ancient astronomical observatory used to track the phases of the Moon
C It was the burial site of an ancient Egyptian Pharaoh
D It was used as a trading hub for early civilizations (1)

49. Who is credited with the invention of the telescope in the early 17th century?

A Isaac Newton
B Galileo Galilei
C Johannes Kepler
D Hans Lippershey (1)



50. According to Khoi-San mythology, the "Great Hunter" constellation represents:

A A powerful leader who taught the Khoi-San people survival skills
B A group of ancestors who protect the people from harm
C A place where the gods live and send messages
D A hunter who chased animals across the sky (1)

https://www.researchgate.net/publication/233464380_Coat_of_Arms_and_the_Body_Politic_Khoisan_Imagery_and_South_African_National_Identity

**TOTAL MARKS = 50**