

ICATS SCIENCE CONTEST



2022 QUESTION BOOKLET

**GRADE 5 & 6
JUNIORS**

Time Allowed: 90 Mins.
Maximum Marks: 90



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CATS CONTESTS

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ICATS SCIENCE CONTEST 2022

JUNIORS (GRADE 5 & 6)

TIME ALLOWED : 90 MINUTES, MAXIMUM MARKS : 90

TOTAL QUESTIONS : 30 MCQS

INSTRUCTIONS

1. DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATORS.
2. INSTRUCTIONS FROM THE EXAMINATION INVIGILATORS MUST BE CARRIED OUT PROMPTLY.
3. CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.
4. RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.
5. USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.
6. USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.
7. EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.
8. CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.
9. NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT INTO THE ROOM.
10. THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:
 - A. TODDLERS (GRADE 1 & 2)
 - B. KIDS (GRADE 3 & 4)
 - C. JUNIORS (GRADE 5 & 6)
 - D. JUVENILES (GRADE 7 & 8)
 - E. ADOLESCENTS (GRADE 9 & 10 / O-LEVELS)
11. REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
12. NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.
13. IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
14. FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT WWW.CATSCONTESTS.ORG
15. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT INFO@CATSCONTESTS.ORG

Q1. A diagram of a moon phase is shown below.



Which shows the correct order of the moon phases that would follow?

A



First Quarter



Full Moon



Crescent Moon

B



First Quarter



Full Moon



Last Quarter

C



Full Moon



Crescent Moon



First Quarter

D



Crescent Moon



Full Moon



First Quarter

Q2. Which of these is the correct order of the planets (including the dwarf planet)?

- A** Mercury, Venus, Mars, Earth, Saturn, Jupiter, Uranus, Neptune, Pluto
- B** Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto
- C** Mars, Venus, Earth, Mercury, Jupiter, Saturn, Uranus, Neptune, Pluto
- D** Earth, Venus, Mercury, Mars, Jupiter, Saturn, Neptune, Pluto, Uranus



Q3. Which color cloud is carrying the most water?



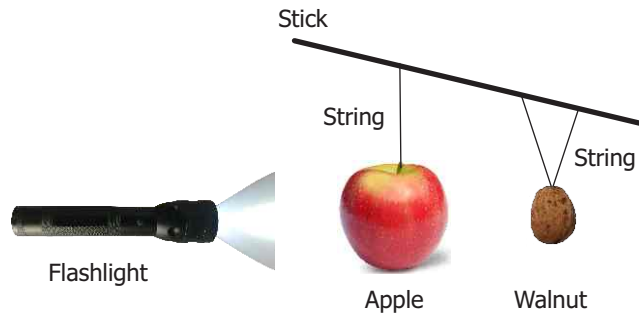
- A** White
- B** Light gray
- C** Dark gray
- D** Black



Q4. Many woodland birds have adapted short wings. What advantage does this give them?

- A** Short wings help birds fly quietly
- B** Short wings help birds fly between trees
- C** Short wings help birds find more food
- D** Short wings keep birds cooler in the summer

Q5. A teacher uses a flashlight, an apple, and a walnut to show a lunar eclipse.



This lab setup best demonstrates that a lunar eclipse occurs during a

A New moon.

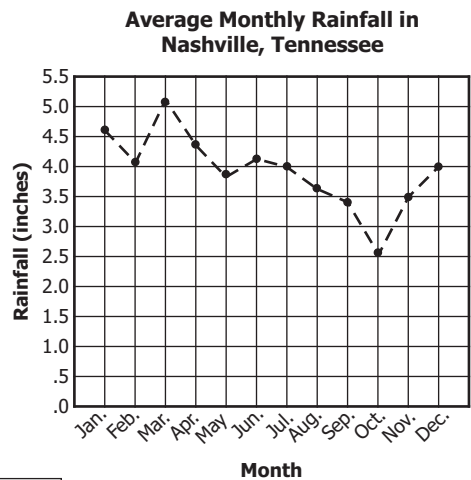
B Full moon.

C First quarter moon.

D Crescent moon.

Q6. A group of students researched and collected data for a report on the weather in Nashville, Tennessee, for one year.

Based on the data, the students concluded that all cities in Tennessee will receive approximately 3.6 inches of rainfall next August. Which best explains why the students' conclusion is incorrect?



A The data collected did not include yearly rainfall amounts.

B The data collected did not include daily rainfall amounts.

C Rainfall averages were collected only from one city.

D Rainfall averages were not compared to a previous year.

Q7. Atif often sees birds near his school. He wants to find out how these birds get the energy they need to live. Which investigation would best help Atif answer this question?

- A** Using the Internet to learn where these birds live
- B** Counting the number of these birds near his school
- C** Asking the teacher if other animals eat these birds
- D** Observing what these birds eat every day for a week



Q8. Many desert lizards spend daylight hours under rocks, as shown.



This behavior is mainly a response to which part of the environment?

- A** lack of rain
- B** high temperatures
- C** shifting sand
- D** high winds



Q9. Which of the following is the smallest bird of the world?

- A** Hummingbird
- B** Robin
- C** Curlew
- D** Greenfinch

Read the text below and answer the questions 10 through 13.

Have you ever wondered how you are able to remember things for a long time? How can you remember your own name or your phone number? How does your brain allow you to learn things in school? And where are those memories kept? These kinds of memories are called long-term memories, and it is important to understand that memory works in three major steps. The first step is known as encoding, or processing new information. After the information is processed by the brain, it can be retained, or stored as a memory. The third step is called retrieval, which is when you remember the memory. All of these steps happen in the brain, but how does the brain do it?

Memories all start as new information. When you experience or learn something new, your brain processes this new information based on what it means or how it looks, sounds, and feels. Here's an example of how this works. Try to memorize this list of words: school, truth, computer, bravery, pizza. May be it's easier for you to remember the words school, computer, and pizza. This is because your mind might have also thought of images of these things. Your brain processed these words based on what they mean and also how they look. For the words truth and bravery, your brain probably processed them only based on what they mean. Now that your brain has processed this list of words, it can be stored in your brain as a memory.

Some memories are kept for a short time, like the list of words you just memorized. Other memories are kept for a long time, like facts you've learned in school, how to use a computer, or memories from when you were eight years old. These are long-term memories. Memories are stored in different parts of the brain, but the memories of events in your life are mostly stored in a special part of the brain called the hippocampus. The hippocampus is located in the temporal lobe, which is one of the four lobes of the brain. Events in your life include your first day in school and times you've spent with a friend.

After your memories are stored, you can access them later. Accessing a memory is what happens when you remember it. People can remember memories in different ways. One common way people remember an event in their lives is when they experience something connected with the memory. For example, imagine you became friends with someone at a playground that's far from home, and you had a great time playing there that day. Since then, this friend has become your best friend. Now, you are passing the playground for the first time since that day. As you look at the playground, you remember playing there and meeting your best friend. It feels like you jumped back in time. In this example, there is a connection between the playground and the memory of playing there with your best friend, but memories can be connected to anything. Specific sounds, smells, or words are commonly connected to memories.

The human brain is an incredible and complex organ, but there is still much more to learn about it. Scientists continue to study the different ways that parts of the brain work together. They are constantly learning more about how human memory and learning works.

Q10. What are the three major steps of how memory works?**A** process, access, complex**B** fight, flight, freeze**C** school, computer, pizza**D** encode, retain, retrieve

Q11. According to the example in the text, how might the way your brain processes the words school, computer, and pizza compared to the way it processes truth and bravery?

- A** School, computer, and pizza are more important than truth and bravery so your brain will pick them to remember.
- B** It is easier for your brain to remember things that you can taste, so it is more likely to remember school, computer, and pizza.
- C** It is easier for your brain to think of images for school, computer, and pizza which may make them easier to remember.
- D** School, computer, and pizza are shorter than truth and bravery so it is easier for your brain to remember those words.



Q12. What conclusion can you draw from this evidence about the types of things that are more likely to become long-term memories?

- A** Random strings of words or numbers are more likely to become long-term memories.
- B** All the things you learn on a computer are more likely to become long-term memories.
- C** Important events and information are more likely to become long-term memories.
- D** Specific details, like the colors of walls, are more likely to become long-term memories.



Q13. Where would your brain store the memory of your 10th birthday party or your first water polo game?

- A** amygdala **B** hypothalamus **C** prefrontal cortex **D** hippocampus

Q14. This boomslang snake is swallowing a frog. Boomslang snakes can use their fangs to inject venom into their prey. But like other snakes, boomslang snakes do not have teeth that they can use to chew their food.

Instead, snakes swallow their prey whole. Snakes have a flexible esophagus that helps them take in whole food.



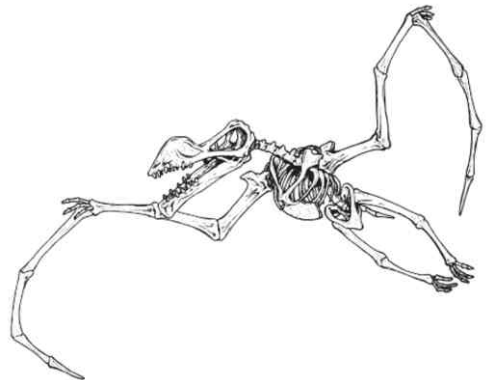
How does a flexible esophagus help a snake take in whole food?

- A** A flexible esophagus can stretch around whole prey and push the prey from the mouth to the stomach.
- B** A flexible esophagus can digest whole prey quickly.
- C** A flexible esophagus can stretch around whole prey and push the prey from the stomach to the small intestine.
- D** All of the above.



Q15. Which of these can best be concluded about the animal that this fossil came from?

- A** It had the ability to fly.
- B** It was a plant eater.
- C** It hunted at night.
- D** It traveled in a pack.



Q16. Which of the following could be the root cause of food insecurity?

A Chronic hunger

B Poverty

C Malnutrition

D Deficiency of vitamins and minerals

Q17. Which of the following is not a benefit of plastic recycling?

A None of the given options

B Clearing of landfills spaces

C Energy can be conserved

D Conservation of National resources

Q18. Fatima wants to recycle her office E-waste.
Which is the correct order of the stages she should follow?

1. Shredding and Sorting
2. Collecting and Transportation
3. Magnetic Separation
4. Dust Extraction
5. Water Separation
6. Purification of Waste Stream

A 1,4,2,5,3,6

B 1,2,3,4,5,6

C 4,1,3,2,5,6

D 2,1,4,3,5,6

Q19. Solar energy is a perpetual and an important renewable resource, and there are some factors which affect the efficiency of solar power. According to this statement find out the option which is not considered as a factor influencing solar power to produce electricity.

A Characteristics of solar panels

B Soiling

C Bore depth

D Intensity of temperature

Q20. Consider the statements A and B and choose the correct options.

Statement A: Wind is a source of energy which is non-contaminating and inexhaustible, the turbines make power without utilizing petroleum derivatives and works without delivering greenhouse gases and substances or radioactive or harmful material.

Statement B: Wind turbines don't produce a similar measure of power constantly. There will be occasions when they produce no power by any means.

A Statement A is incorrect and B is correct.

C Both statements are correct.

B Statement A is correct and B is incorrect.

D Both statements are incorrect.



Q21. The passage below describes an experiment. Read the passage and identify the question that Mateo's experiment can best answer.

Mateo put one two-inch steel nail into each of six test tubes. He added water to three of the test tubes and vinegar to the other three. In each test tube, he completely covered the nail with the same volume of liquid. Mateo checked the nails for rust at the same time every day. He recorded how many days it took each nail to become completely covered in rust.

A Do steel nails rust in fewer days when submerged in a large volume of liquid compared to a small volume?

B Do steel nails take fewer days to rust in water compared to vinegar?

C Do steel nails rust in fewer days when submerged in a large volume of vinegar compared to a small volume?

D All of the above.

- Q22.** The passage below describes an experiment. Read the passage and identify the question that Joe's experiment can best answer.



Joe set up five pairs of platform bird feeders around his yard. He filled one feeder in each pair with sunflower seeds and the other feeder with flax seeds. For one week, Joe watched cardinals visiting the feeders during the same hour each morning. During his observations, Joe counted the number of visits by cardinals to feeders with sunflower seeds and the number of visits by cardinals to feeders with flax seeds.

- A** Do cardinals eat more seeds per visit from feeders containing sunflower seeds compared to feeders containing flax seeds?
- B** Do cardinals visit feeders containing sunflower seeds more often than feeders containing flax seeds
- C** Both of the above.
- D** None of the above.

Q23. Fatima leaves a glass jar of cold tea outside in full sunlight. When she goes to get it, she notices that the tea is warm. She wonders what factors affect how warm a liquid gets from sitting in the sunlight. So, she decides to design an experiment. She has the following supplies available:

- Two identical glass jars
- Two jar lids
- Tap water
- A measuring cup
- Two thermometers

Using only these supplies, which question can Fatima investigate with an experiment?

A When placed in the sun, will eight ounces of water in a glass jar or eight ounces of water in a plastic cup get warmer?

B Will eight ounces of carbonated water or eight ounces of tap water get warmer when placed in a jar in the sun?

C None of the above.

D All of the above.



Q24. The clay boat and clay ball have the same mass. Which property causes the boat to float and the ball to sink?

A color

B mass

C shape

D texture

Q25. People often think of temperature as how hot or cold something is. But what exactly is temperature?

Temperature is a measure of kinetic energy. Every substance is made up of particles. The temperature of a substance is related to the kinetic energies of these particles. If a substance is hot, its particles tend to have a large amount of kinetic energy.

The particles in a substance have kinetic energy because they are moving. The particles are constantly in motion, even if the substance does not appear to be moving.



Select the statement that is true about the rubber ball shown above.

- A** The temperature of the ball depends on the kinetic energies of the particles that make up the ball.
- B** If the ball is cold, its particles tend to have a small amount of kinetic energy.
- C** The particles that make up the ball are moving even when the ball is not.
- D** All of the above.



Q26. Plants, animals, and all other organisms need energy from food to live and grow.

How do organisms get energy from food? Inside an organism's cells, food molecules are broken down and rearranged through chemical reactions. The reactions release chemical energy that the cells can use to power growth and other important cell processes. These processes allow the entire organism to live and grow.

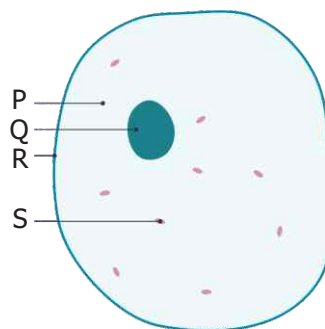
Select the true statement.

- A** Chemical energy can be used for cell growth.
- B** Molecules from food can provide energy.
- C** Animals need food, but plants don't.
- D** Both, A and B.



Q27. Which of the labeled parts of the cell is its controlling centre?

- A** P
- B** Q
- C** R
- D** S



Q28. Select the one true statement.

- A** The cell membrane stores nutrients, water and waste in a plant cell.
- B** In an animal cell, the endoplasmic reticulum helps ribosomes build proteins.
- C** Plant cells can have mitochondria but do not have vacuoles.
- D** All are true statements.

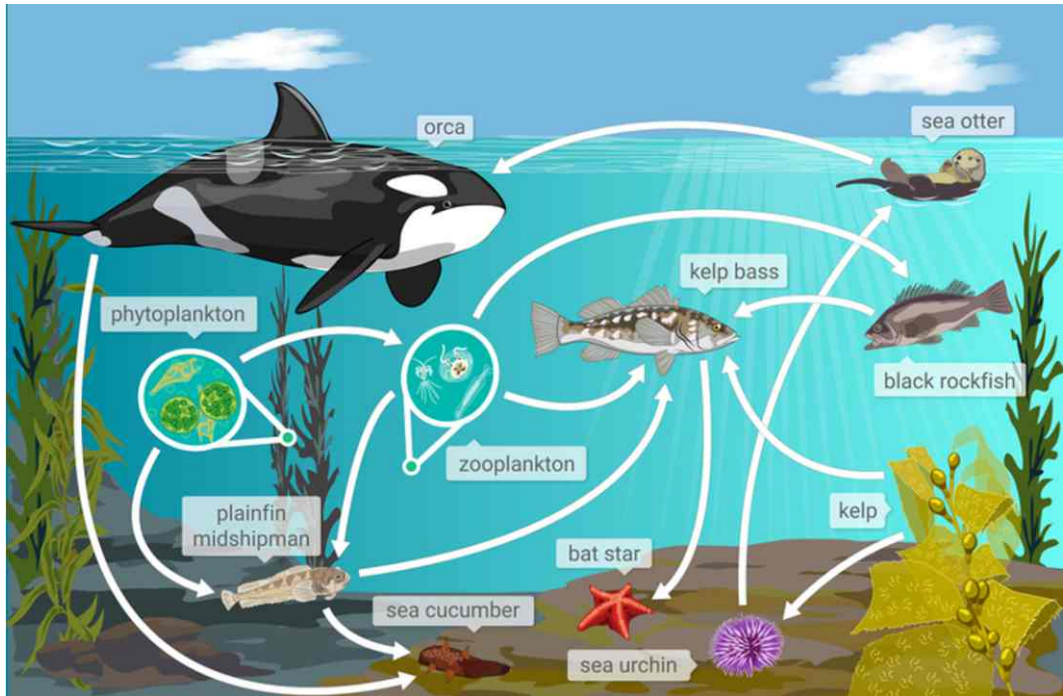
Q29. Dana and her brother each brought a burrito to a family picnic. The burritos were identical, but one was in a metal lunchbox and one was in a plastic lunchbox. This table shows how the temperature of each burrito changed over 2 hours.

Burrito	Initial Temperature (°C)	Final Temperature (°C)
Burrito in the metal lunchbox	80	33
Burrito in the plastic lunchbox	79	40

The next time Dana brings a burrito to a picnic, she does not want it to cool down quickly. What should she do?

- A** Use the metal lunchbox
- B** Use the plastic lunchbox
- C** Either, the rate of thermal energy transfer is the same whether the lunchbox is metal or plastic
- D** Use neither, both are poor conductors of heat

- Q30.** A food web models how the matter eaten by organisms moves through an ecosystem. The arrows in a food web represent how matter moves between organisms in an ecosystem. In this food web, which organisms contain matter that eventually moves to the sea cucumber?



- A** phytoplankton
- B** sea otter
- C** zooplankton
- D** All of the above

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Congratulations

ICATS Art Contest 2022 National Toppers

Student Name	Father Name	Grade	School
HUMNA NADIR	M. NADIR IKRAM	1	FOUNDATION PUBLIC SCHOOL
HAIDER ALI	ALI MUSHTAQ	2	ARMY PUBLIC SCHOOL & COLLEGE
MUHAMMAD YOUSAF	KAMRAN ASHRAF	3	KOHSAR CHILDREN'S ACADEMY
MUHAMMAD ZAID	M. SOHAIB NIZAMI	4	GENERATIONS SCHOOL
HANIA ABID	MRS. ASMA LATIF	5	FATIMA FERTILIZER SCHOOL
RUQAIYAH ALI ASGHER	ALI ASGHER KHAMBATWALA	5	MSB EDUCATIONAL INSTITUTE
RAMISHA ALI	ABID ALI MUGHAL	6	GOVT. QUEEN MARY GRADUATE COLLEGE
SYEDA FATIMA SURIYA	SYED TAHIR HUSSAIN	7	BEACONHOUSE SCHOOL SYSTEM
MANAL ARSHAD	MUHAMMAD ARSHAD	8	HABIB GIRLS SCHOOL
MARYAM SHAHID	SHAHID IQBAL	9	BAHRIA COLLEGE
AREEBA KHAN	DURAIZ KHAN	10	PRESENTATION CONVENT HIGH SCHOOL

ICATS Creative Writing Contest 2022 National Toppers

Student Name	Father Name	Grade	School
HASSAN WASEEM	M. WASEEM	1	PAKISTAN INT'L PUBLIC SCHOOL
M. AFNAN SUFDER	SUFDER HUSSAIN	2	ARMY PUBLIC SCHOOL AND COLLEGE SYSTEM
FATIMA NOOR	BILAL YOUSAF	3	LAHORE GRAMMAR SCHOOL
M. ABDULLAH HASSAN	RIZWAN AHMAD	3	LAHORE GRAMMAR SCHOOL
SHANZAY ADNAN	ADNAN FAROOQ	3	ARMY PUBLIC SCHOOL
PRATIK PARKASH	PARKASH LAL	4	THE CITY SCHOOL
DANIYAL SHAHZAD	SHAHZAD ASLAM	5	LAHORE GRAMMAR SCHOOL
HASSAN ALI	IMRAN ALI SHAH	6	ARMY PUBLIC SCHOOL & COLLEGE
MAIDA SOHAIL	SOHAIL AKRAM	7	BEACONHOUSE SCHOOL SYSTEM
ATIYA ATIF	MUHAMMAD ATIF NAZAR	8	ROOTS IVY INTERNATIONAL SCHOOL
AYESHA HAFEEZ	CH. GHULAM HAFEEZ	8	ISLAMABAD COLLEGE OF ARTS & SCIENCES
PARTHAM KUMAR	DOULAT RAM	9	AGA KHAN HIGHER SECONDARY SCHOOL
AMNA HUSNAIN	SYED ALI ZAFAR	10	AES SCHOOL FOR GIRLS
RASIKH JAVED	M JAVED	10	BAHRIA FOUNDATION COLLEGE

Compete
if you are the best