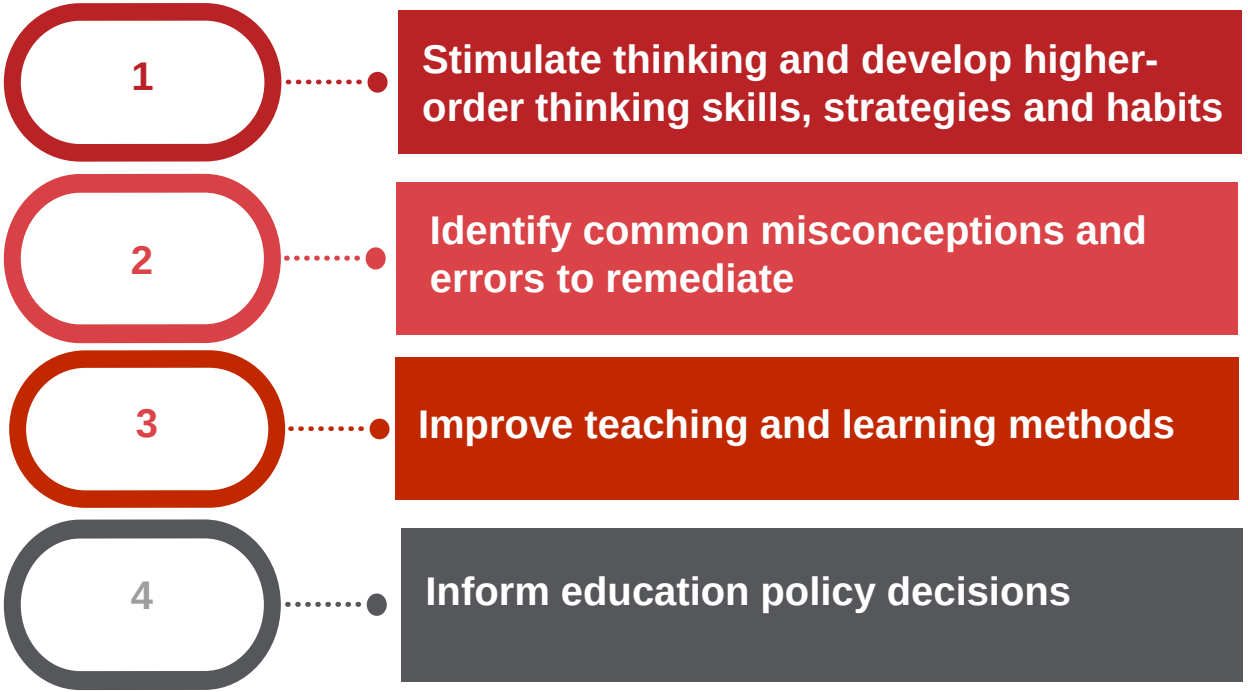
COMPETENCY BASED MCQs

Why ask good questions?

Carl Jung: ***"The right question is already half the solution to a problem."***



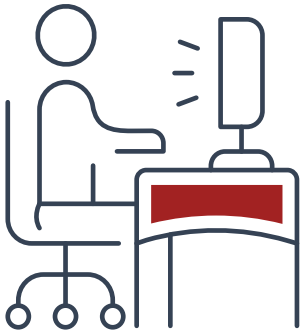
Why ask good questions?

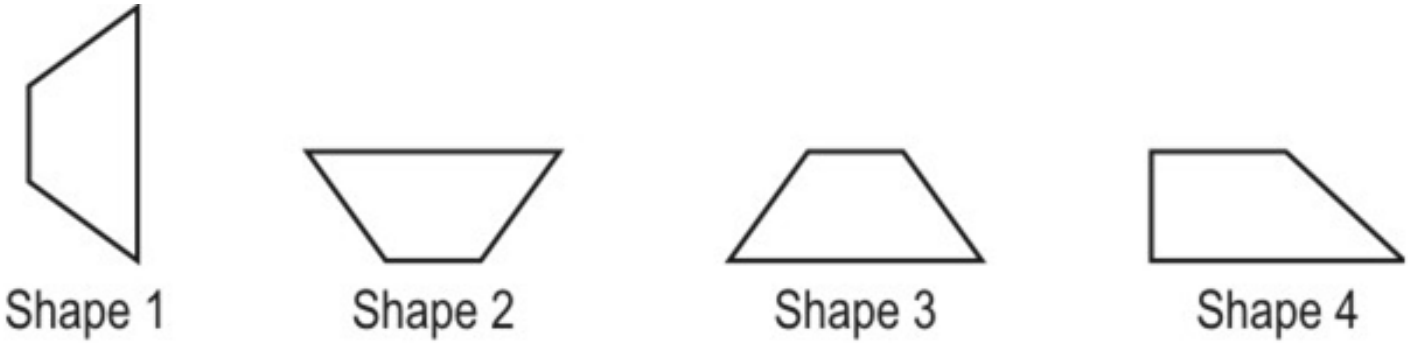
It influences how students learn. The right kind of question stimulates thinking.

Draw two trapeziums.

VS

Tick the shapes that are trapeziums among the shapes below.



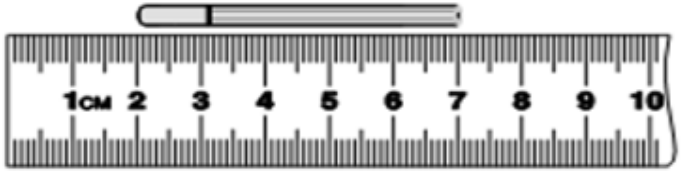


Only 28.6% of 22016 students of class 8 could identify all 4 shapes as trapeziums.
52.2% selected shapes 1, 2 and 3 as trapezium.

Why ask good questions?

Which of the two questions is better? Why?

The length of the pencil is about _____.

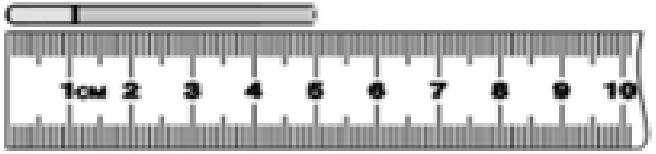


A. 4 cm **B.** 5 cm **C.** 6 cm **D.** 7 cm



VS

The length of the pencil is about _____.

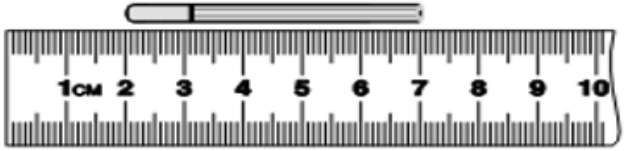


A. 4 cm **B.** 5 cm **C.** 6 cm **D.** 7 cm

Why ask good questions?

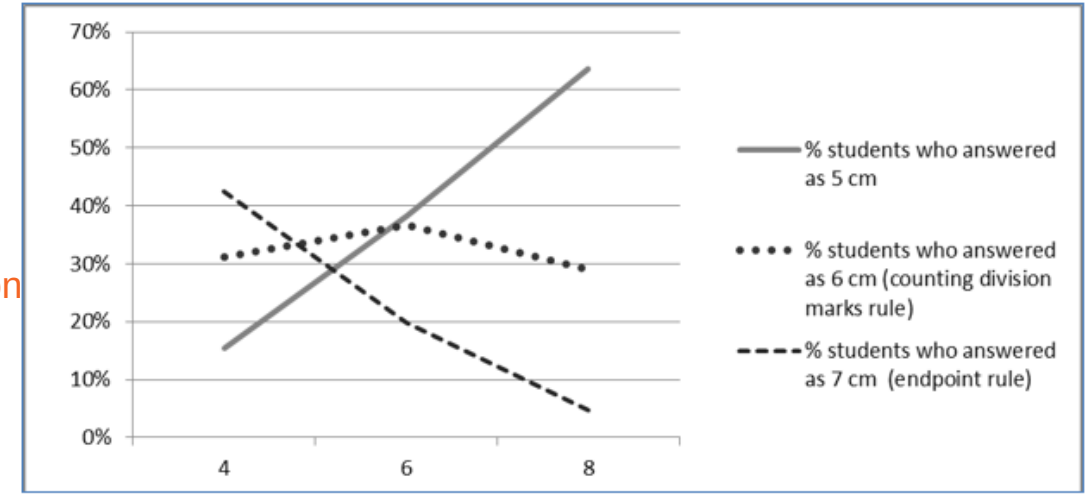
Helps to diagnose common misconceptions and errors

The length of the pencil is about _____.



A. 4 cm **B.** 5 cm **C.** 6 cm **D.** 7 cm

% students answering a particular option



Grades

Why ask good questions?

Influences how students learn – the right kind of question stimulates thinking.

Underline the adjective in the sentence below.

The truck suffered heavy damage.

Vs

The truck suffered heavy damage.

In the above sentence, the underlined word is an:

a. adjective, because it modifies the noun 'damage'.
b. adverb, because it modifies the verb 'suffer'.
c. adjective, because it modifies the noun 'truck'.
d. adverb, because it modifies the verb 'damage'.

Why ask good questions?

Distinguishes mechanical learning from learning with understanding

Q1. Which of the following is the meaning of the phrase 'call it a day'?

A. make a schedule
B. stop working on something [CA]
C. invite people to a public event
D. inform someone about your arrival

Q2. Read the sentence given below.

I have tried everything to fix this broken pipe but have not been able to. I am going to _____!

Which of the following correctly completes the above sentence?
A. bite the bullet
B. break a leg
C. call it a day [CA]
D. cut corners

Why ask good questions?

It influences how students learn – the right kind of question stimulates thinking

The Earth Summit was held in Rio de Janeiro in:

A. 1987 B. 1990 C. 1992 D. 2002

V/S

Common But Differentiated Responsibilities is a principle that acknowledges that countries have different capacities but a common responsibility towards addressing climate change.

Accordingly, which of the following scenarios aligns closely with the above-mentioned principle?

1. Germany spending more money than Bhutan on carbon reduction.
2. Germany attempting to reduce global carbon emissions all on its own.
3. Bhutan completely depending on other countries to reduce carbon emissions.
4. Both Germany and Bhutan spend an equal amount of money on carbon reduction.

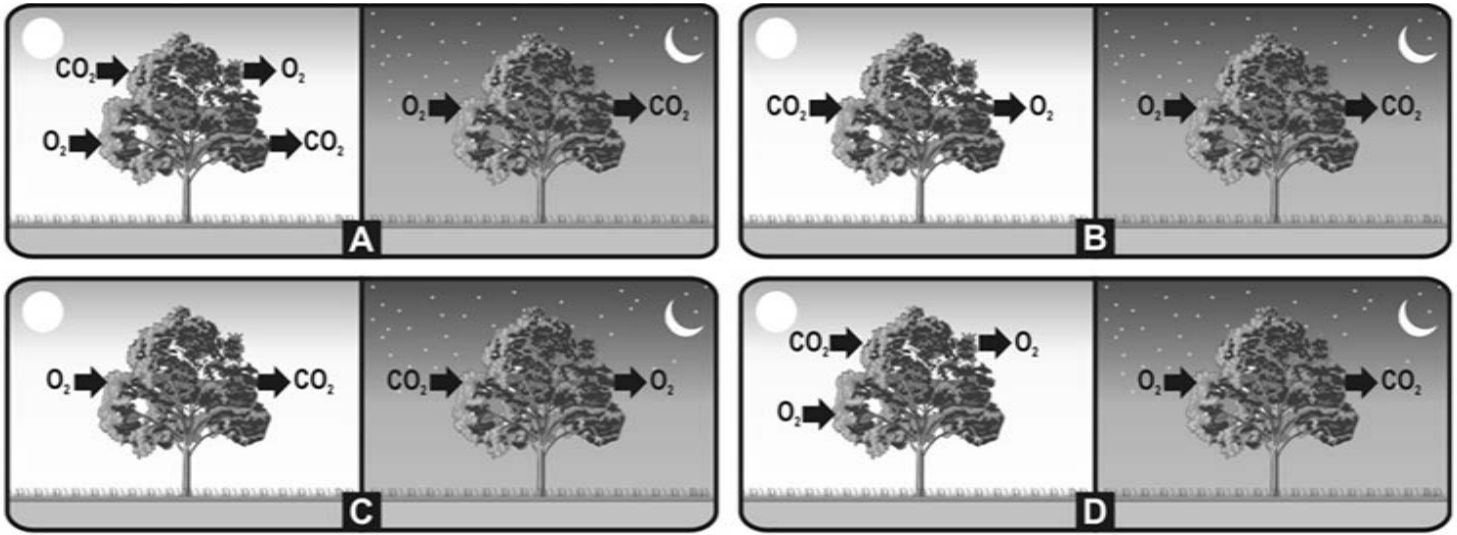
Why ask good questions?

It influences how students learn – the right kind of question stimulates thinking.

Differentiate between photosynthesis and respiration.

V/S

Which of the following schematics correctly represents the exchange of gases by a plant at different times?



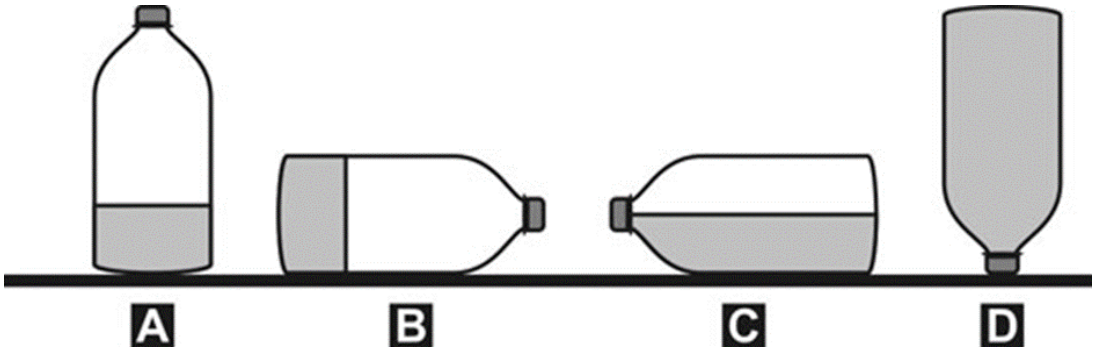
Why ask good questions?

It influences how students learn – the right kind of question stimulates thinking.

What are the properties of a solid substance?

V/S

Which of the following closed bottles DEFINITELY contains a solid substance?



Why ask good questions?

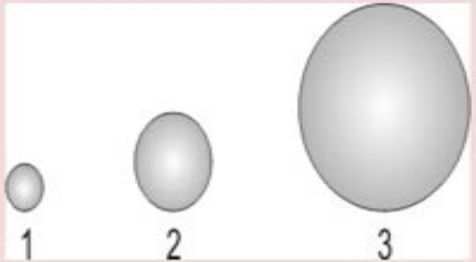
- Influence how and what a student studies (opportunity to focus on what's really worth learning)
- Provide feedback on what students are learning and what have they not learnt, to inform appropriate remedial instructions
  - ✔ Distinguish mechanical learning (apparent) from learning for understanding (real)
  - ✔ Identify common misconceptions and errors
- Stimulate thinking and develop higher level thinking skills, strategies and habits



Making a question with these characteristics is one of the recipes to make a good question assessing conceptual understanding!

Understanding the MCQ form – its terminologies

Roma has 3 solid balls, all of equal weight. The sizes of the three balls are as shown below.



If ball 2 sinks in water, which of the other balls will DEFINITELY sink in water?

A. only ball 1
B. only ball 3
C. both ball 1 and ball 3
D. cannot be sure

Key

Distractor

Stem

Options

Types of MCQs

Simple MCQ items

Who among the following can be nominated by the president to Rajya Sabha?

1. N. V. Ramana, the 48th and the current chief justice of India
2. Neeraj Chopra, 27-year-old reigning Olympic champion in the javelin throw
3. Satya Nadella, an Indian American who is the chief executive officer of Microsoft
4. A. R Rahman, 55-year-old film composer, record producer, singer, and songwriter

Which of the following situations DEFINITELY involves some form of credit?

A.Aman sends his son Rs.500 to pay his school fees.
B.Irfan gives Rs.1000 to a shopkeeper for buying a pair of shoes.
C.Paul gives Rohan Rs.100 today and asks him to pay him back in the next few days.
D.Simran gives Rs.300 to an organisation which helps people who do not have money for food.

Types of MCQs

Complex MCQs

Which of the following are examples of respiration?

1. Humans use oxygen and release carbon dioxide.
2. Plants use carbon dioxide and release oxygen.
3. Burning dry leaves uses oxygen and releases carbon dioxide.

A. only 1
B. only 2
C. only 1 and 2
D. all - 1, 2 and 3

Which of the following can INCREASE the rate of a chemical reaction?

P) increasing the temperature
Q) increasing the concentration of products
R) adding a catalyst
S) increasing the concentration of reactants

A. only Q and S
B. only P and Q
C. only P, R, and S
D. all - P, Q, R, and S

Types of MCQs

Multiple-choice – Context-dependent or case-based items

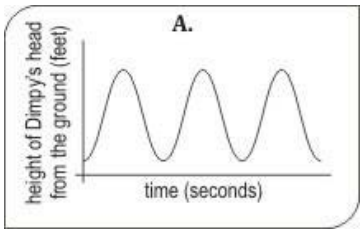
The London eye is a giant Ferris wheel in London with people made to sit in capsules as shown in the figure.

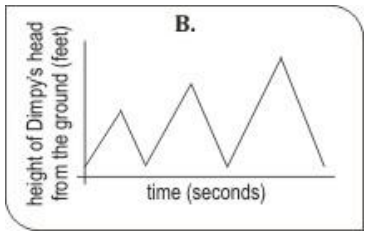


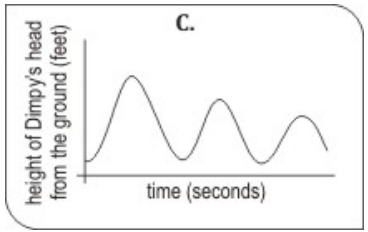


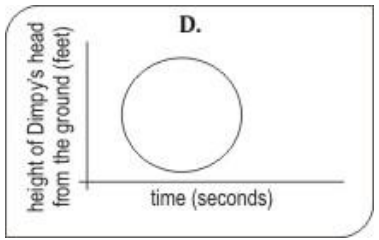
It takes approximately 40 minutes to complete one revolution at a constant speed.
Dimpy enjoys a ride on the London eye completing 3 rotations.

Which of these COULD be the graph describing the height of her head from the ground during the ride?









Types of MCQs

Multiple-choice – Assertion-Reason Type of Question

Select the option that is true for the two statements given below.

(1) The revenues generated at the box office have increased.

(2) Majority of the top films in the UK are based on published material.

A. (1) is the result of (2).

B. (1) is the reason for (2).

C. (1) is independent of (2).

D. (1) contradicts (2).

Correct answer: B

From CBSE X Term 1 – 2021-22

Types of MCQs

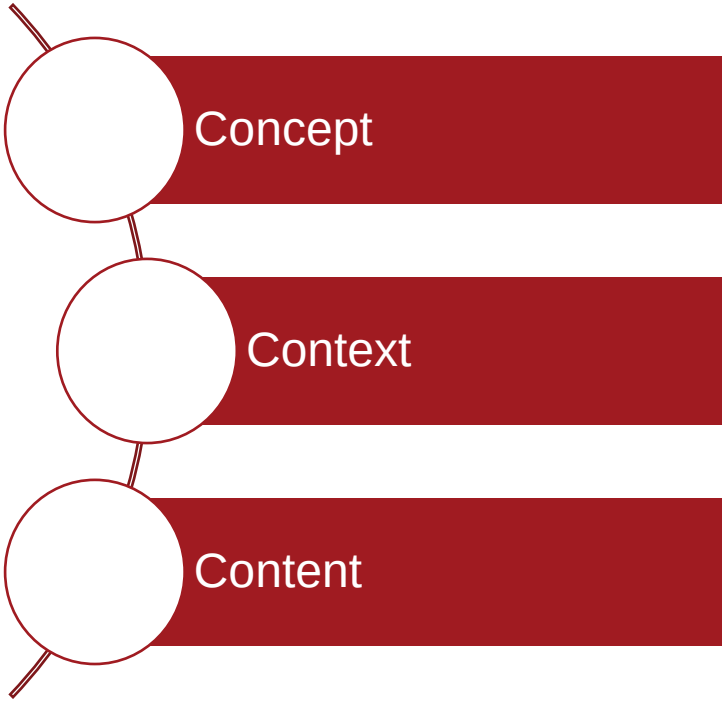
Multiple-choice – Assertion-Reason Type of Question

There are two statements given below, marked as Assertion (A) and Reason (R). Read the statements and choose the correct option.

A: When the pasture is depleted in one location, pastoralists prefer moving their livestock to new areas to prevent overgrazing.
R: Pastoralists believe in the effective use of available pastures in different places.

1. A is true but R is false.
2. A is false but R is true.
3.Both A and R are true and R explains A.
4. Both A and R are true but R does not explain A.

What Makes a Question Good



Testing objective

The situation/scenario through which the concept is presented and tested

Clarity of language

Qualities of good MCQs

Assess core concepts or enduring area of understanding.

Concept/competency assessed: Assess the relationship between speed of light and RI

The speed of light is greatest in which material?

A. Water
B. Quartz
C. Diamond
D. Methanol

Assess knowledge of speed of light in different media. While students should know speed of light in maximum in medium with lowest RI, remembering the RI of different media is not an enduring area of understanding. Not remembering the RI values does not affect understanding of refraction.

MCQ should assess an important concept/understanding. It should be an enduring understanding, important to understand higher grade concepts.

Qualities of good MCQs

Assess core concepts or enduring area of understanding.

Concept/competency assessed: Factors and multiples of a natural number

Which of these is a Mersenne prime number?

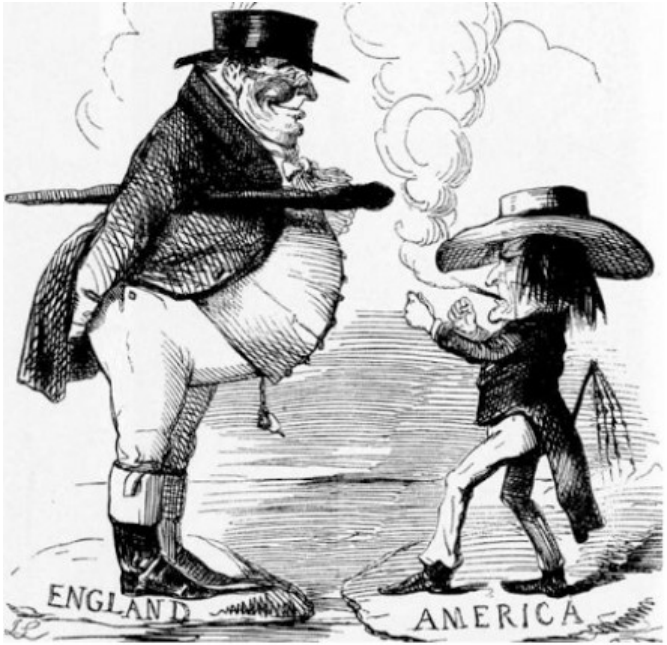
A. 2
B. 7
C. 9
D. 15

Assesses understanding of what are Mersenne primes. While it is good to expose to students to different types of numbers for appreciation of Maths, the concept assessed is not an enduring area of understanding. Not knowing Mersenne primes will not affect learning of other important concepts in Maths.

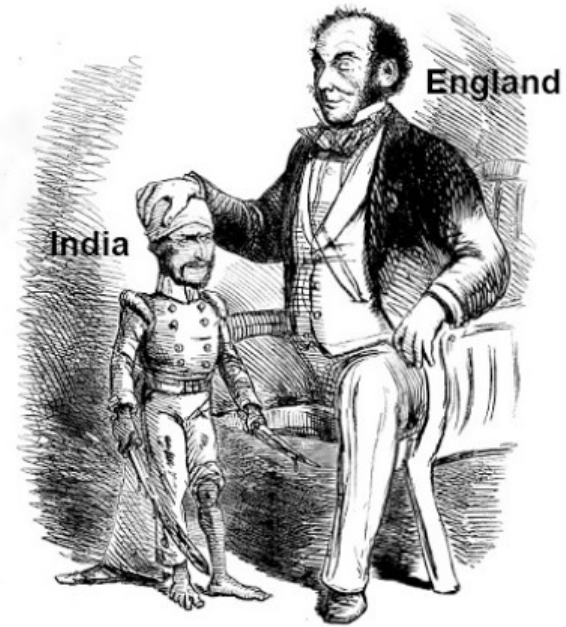
MCQ should assess an important concept/understanding. It should be an enduring understanding, important to understand higher grade concepts.

Qualities of good MCQs

Checks an enduring learning outcome of how Indians were perceived.



England: "What? You young Yankee-noodle, you musn't strike your own father!"



England: "Well, then, they shan't blow him up, but he must promise to be a good little sepoy."

Cartoons like these appeared in London newspapers during the 19th century.
They suggested that the British viewed the colonies as _____.

1. capable, worthy and strong rivals
2. innocent and able to doing no harm
3. powerless before the might of the empire
4. lacking in military prowess

Alignment to the testing objective

Select the question that aligns with the testing objective.

Testing Objective: To use the correct form of a word in context

GRADE 5

QUESTION 1

He is very _____ because he never shouts and always says ‘please’.

Which of these options completes the given sentence correctly?

a. respect
b. respectful
c. respecting
d. respectfully

QUESTION 2

He is very _____ because he never shouts and always says ‘please’.

Which of these options completes the given sentence correctly?

a. powerful
b. colourful
c. respectful
d. successful

What makes an MCQ good – Qualities of good MCQs

Ensure intended concept is assessed.
Beware of possibility of the strategy of eliminating options not intended.

Concept/competency assessed: Knowledge of hormones and their functions

_____ produced by the pituitary gland are responsible for the onset of puberty.

A. Insulin
B. Adrenaline
C. Growth hormones
D. Thryoxine

Since the statement mentions 'are' - the correct answer is likely to be a plural form and so students may choose C.

The stem and options should be free from test-wise factors which help students in eliminating options.

Irrelevant Difficulties

- Unnecessary high reading load

- Grade inappropriate language:

vocabulary – avoid low frequency words (unless testing the same)
syntax – use simple sentences
voice – use active

- Tricking

- Negative phrasing or use of double negatives

- Use of unrealism and irrelevant humour in stimulus

- Illogical arrangement of options

- Presence of sensitive factors, bias, stereotyping, unfairness

Irrelevant Difficulties

Difficulties that prevent students with good understanding from answering the question.

Can you spot any irrelevant difficulties in this question? GRADE 6

A popular episode from the epic, Ramayana, is Lord Rama's Ashwamedha Sacrifice (Horse Sacrifice) that led him to meet his two sons, Luv and Kush. As a part of the sacrifice, Lord Rama's horse was left to wander. It happened to go through the forest where Luv and Kush lived with their mother. They encountered the horse and captured it. Lord Rama's army attacked the young boys, but began to retreat because the young boys were too strong for them.
The idea of the Ashwamedha Sacrifice described in the Ramayana was also performed historically at various janapadas that had been established in Ancient India. What could be a reason for this rite?

1. sending parties to seek natural resources for economic growth
2. conquering of new territories and expansion of the kingdom
3. letting out horses to graze freely for better health of cattle
4. worshipping the forest deities to ensure their blessings

Irrelevant Difficulties

Reduce reading load by taking out common text from the options

Can you spot any irrelevant difficulties in this question?

Which of the following statements is TRUE?

1. Measuring the oxygen produced during photosynthesis can be used to measure the rate of photosynthesis.
2. Measuring the oxygen produced during photosynthesis can be used to increase the rate of photosynthesis
3. Measuring the oxygen produced during photosynthesis can be used to decrease the rate of photosynthesis
4. Measuring the oxygen produced during photosynthesis can be used to measure the CO2 produced in photosynthesis

Irrelevant Difficulties

Reduce reading load by taking out common text from the options

Which of the following statements is TRUE?

1. Measuring the oxygen produced during photosynthesis can be used to measure the rate of photosynthesis.
2. Measuring the oxygen produced during photosynthesis can be used to increase the rate of photosynthesis
3. Measuring the oxygen produced during photosynthesis can be used to decrease the rate of photosynthesis
4. Measuring the oxygen produced during photosynthesis can be used to measure the CO2 produced in photosynthesis

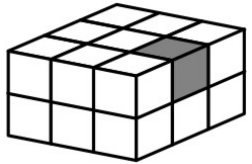
Measuring the oxygen produced during photosynthesis can be used to_____.

1. measure the rate of photosynthesis
2. increase the rate of photosynthesis
3. decrease the rate of photosynthesis
4. measure the CO_2 produced in photosynthesis

Irrelevant Difficulties

Reduce reading load by taking out common text from the options

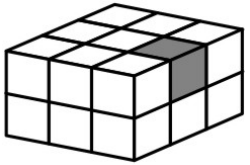
The cuboid shown here is formed using 18 cubes of side 1 cm each.



If the shaded cube is removed, which of these is true?

A. the surface area of new solid is equal to that of the original solid.
B. the surface area of new solid is 2 sq cm less than that of the original solid.
C. the surface area of new solid is 6 sq cm less than that of the original solid.
D. the surface area of new solid is 2 sq cm more than that of the original solid.

The cuboid shown here is formed using 18 cubes of side 1 cm each.



If the shaded cube is removed, the surface area of the new solid is _____the surface area of the original cuboid.

A. equal to
B. 2 sq cm less than
C. 6 sq cm less than
D. 2 sq cm more than

Irrelevant Difficulties

Avoid negative forms especially double negative form of MCQs

Sugarcane production in India shifting from South to North.
Source: National Statistics Office Report

Which of the following may NOT be the reason behind this change?
1. the State governments in the North offering higher prices than the Central government for the produce
2. the availability of more skilled labour, especially after the COVID-19 induced lockdown
3. less dependency on monsoon due to widespread irrigation facilities
4. better climatic conditions and longer crushing seasons in the North

Irrelevant Difficulties

Avoid negative forms especially double negative form of MCQs

Which of the following options doesn't make it impossible to deny that democracy is not the worst form of government?

a) In many democracies, corruption is not unheard of.
b) Democratic decision-making doesn't always result in perfect outcomes.
c) It's not uncommon for democracies to face serious challenges and difficulties.
d) Democracy isn't always perfect which doesn't mean it's not preferable to other forms of government.

Irrelevant Difficulties

Trickery

Given below is a short note on Uncle Anand.

Uncles Anand loves to spread joy and laughter among those around him. His approach in life with a positive attitude is inspirational.

Which of these best describes in the story ‘Thank you, Uncle!’?

A. strict
B. funny *
C. disciplined
D. fun-loving

Does the question help students answer the question without reading the passage?

Read the passage given below and answer the questions that follow.

Skyscrapers are awe-inspiring structures that dominate the urban skyline, reaching ever higher towards the clouds. These towering buildings serve as symbols of human ingenuity, engineering, and architectural prowess. they can be a symbol of inequality, with the tallest and most impressive skyscrapers often being located in wealthy areas and serving as a representation of power and wealth. This can lead to feelings of resentment and division between different socioeconomic groups.

According to this passage, why do skyscrapers divide people?

A. They cost too much to construct.

B. They separate the rich from the poor.

C. They are found only in first-world countries.

D. They only house businesses and not people.

Test-wise factors to avoid

Avoid options not following the stem grammatically and meaningfully (Misaligned cueing)

Which of these feelings closely resembles annoyance?

A. anger
B. courage
C. discipline
D. agreement

Test-wise factors to avoid

Options that can be eliminated using grammatical cues from the stem

Measuring the oxygen produced during photosynthesis can be used to _____.

1. measure the rate of photosynthesis
2. increased the rate of photosynthesis
3. decreasing the rate of photosynthesis
4. measuring the CO_2 produced in photosynthesis

Test-wise factors to avoid

- Misaligned cue - options don’t grammatically and meaningfully follow the stem
- Clanging - keyword in stem repeated only in CA
- Non-parallel options – options that are not homogeneous in look and feel
- Overlapping options – options that can be eliminated using the same logic/reason)
- Absurd options
- Specific or vague determiners (always/never/sometimes/may)
- 'all of the above’ / 'none of the above’ as the correct options

Best practices in framing good MCQs

Keep a mix of both genders and religions in names

Here is what Chris and his friends said about diseases.

Sai: Diseases occur only among people who do not keep themselves clean.
Sarita: If a person has no diseases, he or she must be completely healthy.
Sindhu: A person can be in poor health even if he or she has no diseases.
Asha: Diseases never have similar symptoms.

Who is correct?
A. only Sindhu
B. only Asha
C. only Sai and Sarita
D. only Sarita and Asha

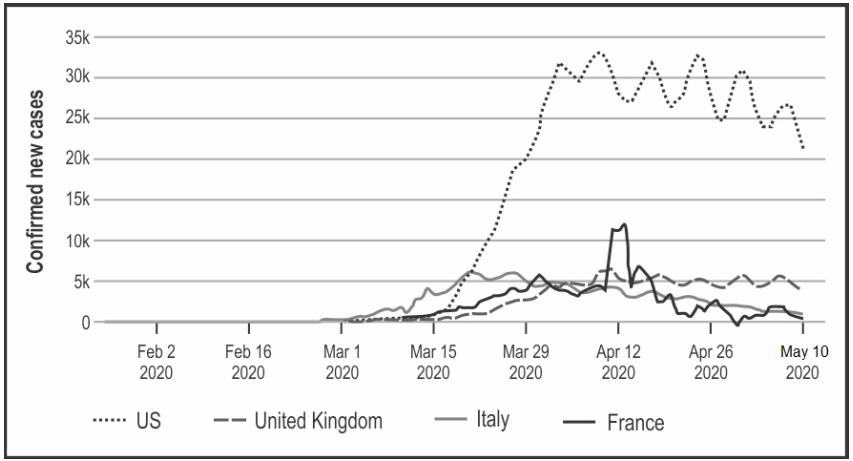
Here is what Chris and his friends said about diseases.

Manoj: Diseases occur only among people who do not keep themselves clean.
Rosie: If a person has no diseases, he or she must be completely healthy.
Bindu: A person can be in poor health even if he or she has no diseases.
Abdul: Diseases never have similar symptoms.

Who is correct?
A. only Bindu
B. only Abdul
C. only Manoj and Rosie
D. only Rosie and Abdul

Use authentic data that is interesting & relatable and acknowledge it

Study this graph of the number of new COVID cases confirmed on each day compared to the previous day in 4 highly affected countries.



Copyrights: 2020 John Hopkins University (Coronavirus resource centre)

Which of these inferences is true based on the graph?

A. France tested the most number of its citizens for COVID around April 12.
B. The US reported the highest number of COVID cases since March 1, 2020 till May 10, 2020.
C. The number of COVID cases was highest in all the 4 countries in the week 30 March – 5 April.
D. The maximum increase in the number of COVID cases in the US was seen between March 16 – March 31.

Best practices in framing good MCQs

Two fair dice are rolled. Which of these is true about the probability of getting the same number on the dice?

A. -1
B. less than 0.2
C. greater than 0.5
D. greater than 0.6

Don’t have overlapping options
(Here C and D are overlapping)

Don’t have absurd wrong options as it is easier to eliminate such options.
(Here -1 is such an option as students would know the probability is never a negative number)

Best practices in framing good MCQs

Context used should be relatable and not have any bias.

Which of the following is the BEST way to divide chores at school?

1. The topper of the class assigns the chores.

2. The students discuss and decide their own chores.

3. The principal divides the chores among the late comers.

4. The teacher decides based on the number of girls and boys in the class.

Best practices in framing good MCQs

Distractors should be arranged in an increasing order (or a descending order) to reduce cognitive load and not give any clue in general.

Which of the following is a way in which people can participate in government processes in India?

1. People celebrating Republic day by hoisting the national flag.
2. People participating in a religious procession.
3. People starting a signature campaign to install street lights.
4. People starting a promotion campaign for the release of a movie.

Which of the following is a way in which people can participate in government processes in India?

1. People participating in a religious procession.
2. People starting a signature campaign to install street lights.
3. People celebrating Republic day by hoisting the national flag.
4. People starting a promotion campaign for the release of a movie.

What Makes an MCQ good?

A good MCQ should

- Test a skill or concept that is worth understanding
- Really test what is intended to be tested
- Be error free
- Be age appropriate
- Be interesting and stimulate thinking
- State what is expected in clear and unambiguous terms
- Use clear, concise and age-appropriate language
- **Have strong and plausible distractors**
- Check for understanding/application in an unfamiliar context
- Use relatable, engaging real life context and not contrived

A good question should NOT

- Check for trivial or inconsequential details
- Be taken directly from the wording in textbooks or readings

- **A good question will give greater feedback on what a learner has learnt and what she has not learnt. (greater diagnostic value)**

- **A good question is simple if the concept is well understood.**

Activity: Making questions applying key principles of assessment and characteristics of good questions

- Form a group
- Each participant creates at least 1 question satisfying the given criteria
- Discuss in a group how principles are applied and criteria met
- Shortlist the best question from the group
- Add on a chart paper and present to the group
- Present to the group

- Should **NOT** be exactly **same/similar** from a reference book
- A problem **situation or context** used is **unfamiliar** to a student.
- **Key principles of good assessments** are applied.
- Assesses a concept which is an **enduring area of understanding**.
- **Cognitive domain mapped** to the question made.
- The question should assess a concept at **cognitive level other than remember and comprehension/understanding** (first 2 cognitive levels as per Bloom's taxonomy)
- Good if diagnoses a misconception

How to make good MCQs - Process

Carry out checks against such a checklist

Parameters
Correctness of the question
Clear single correct answer
Assesses the concept/skill worth assessing
Focus and clarity in the question text
Effectiveness in assessing the intended testing objective
Options' effectiveness in diagnosing misconceptions/error patterns if any
Distractors are strong and plausible
Cognitive skill alignment
Difficulty alignment



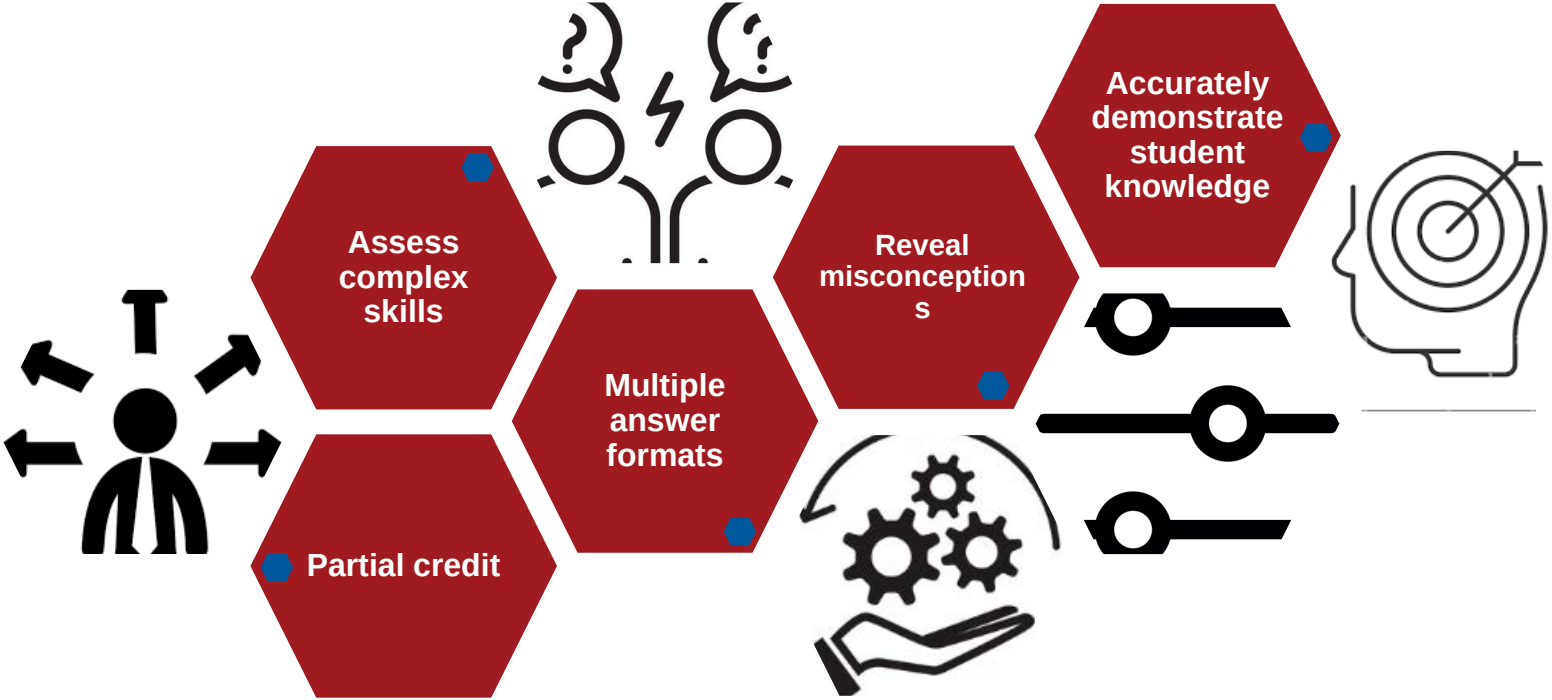
Put yourself in shoes of a student and solve it as if seeing the question for the first time. Also make a note of the time taken to solve!

Guidelines (recommendations) for MCQs

- Assess concept/skill worth assessing
- **Age-appropriate language** and easy to comprehend
  - Use simple tense and active voice.
  - Avoid irrelevant information as far as possible.
- **Distracters are well defined, plausible and discerning**
- The **context** used in a question is **apt** and something students can easily **relate to and engaging**. No bias
- Options are arranged in increasing or decreasing order of numbers or word length to avoid guessing.
- Good to keep calculations as simple as possible
- Good to restrict questions with negatives (not) especially the ones of ‘double negative’ form. Highlight the negative term if using
- Labels in figures are NOT matching with that in options and question text.
  - Avoid labelling objects as A, B, C and D if options are labelled as A, B, C and D.
- Better to restrict use of options as –none of the above, all of the above unless capturing a misconception
- *Variables should always be in italics.*
- *Follow norms for writing units. e.g. 5 km is correct whereas 5 kms is wrong. Ensure units are mentioned.*

Free-Response Questions

Requires students to supply or construct their own responses and answers



Free-Response Questions

What are CRQs?

Constructed

- require students to construct their responses

Response

- require students to create their own answers which may be short or long, an explanation of a procedure, a diagram, or the solution to a numerical problem.

Questions

- CRQs may be better for testing students' ability to critically analyse problems, create and express ideas or explain their reasoning in depth.

What are the different kinds of questions?

- Based on the format of the question
  - True/false, Matching, Very short answer, Essay, Multiple Choice
  - Technology Enhanced Items (computer-based assessment)
- Based on types of responses
  - Open vs Closed response
  - Free Response vs Limited Choice Response
- Based on the skill/cognitive levels being tested
  - Recall/procedural, Conceptual, Application

The Anatomy of a Constructed-Response Question

Directions

Read this story. Then answer questions 30 and 31.

Directions

Excerpt from *Jumanji*

by Chris Van Allsburg

Stimulus

1 "What's that?" Judy asked.

2 "It's a game," said Peter, handing her the box.

How do Peter's feelings about the game change from the beginning of "Excerpt from *Jumanji*" to the end? What causes Peter's feelings to change? Use details from the story to support your response.

Prompt

In your response, be sure to

- describe how Peter feels about the game at the beginning of the story
- describe how Peter feels about the game at the end of the story
- explain what causes Peter's feelings to change
- use details from the story to support your response

Instructions

Principles of devising a good FRQ

A good CRQ should

- Test a concept that is worth understanding
- Test the intended cognitive skill
- Be error free
- Be age appropriate
- Be interesting and stimulate thinking
- State what is expected in clear and unambiguous terms
- Use clear, concise and age--appropriate language
- Avoid irrelevant difficulty

A good CRQ should NOT

- Check for trivial or inconsequential details
- Be taken directly from the wording in textbooks or readings

Different Types of FRQs

Short-response questions

Can be Objective

Question : - What does Julius Caesar say after he watches his friend Brutus stab him with a knife?

Answer: Et tu, Brute?

Different Types of FRQs

Short-response questions

Can be Subjective

Question : - In 2-3 sentences, explain how Julius Caesar might have felt when he realised his friend Brutus wanted to kill him.

Answer:……(multiple possibilities)

Different Types of FRQs – Long response questions

Q: 1 ***The British contributions to Indian infrastructure were intended only for personal gains. Any benefit to the Indian public was unintended, and hence, inadequate.***

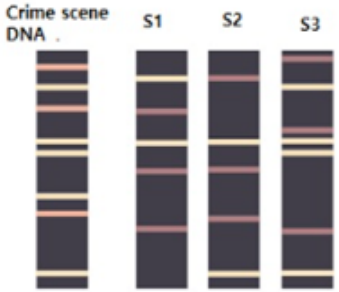
Support the statement with evidence.

Q.No	What to look for	Marks
1	**- Roads primarily served the purposes of mobilising the army within India and drawing out raw materials from the countryside to the nearest railway station or the port.** **- There always remained an acute shortage of all-weather roads to reach out to the rural areas during the rainy season, and so the people living in these areas suffered during natural calamities.** **- Railways were developed to foster the commercialisation of Indian agriculture and increase exports.** **- The volume of exports expanded but the benefits rarely accrued to the people.** **- Social benefits of railways outweighed the country's huge economic loss.** **- Introduction of the expensive system of telegraph served the purpose of maintaining law and order.** **- Postal services, which served useful public purposes, remained all through inadequate.** **- Public health services were inadequately provided, and hence diseases were rampant.** **- Any other relevant point.** **(Any six points to be evaluated.)**	**6**

Types of FRQs: Case-based questions

Case-study questions: Case-based questions typically use a stimulus material, which is often an authentic source of information, and expect students to apply the concepts they have learnt to answer questions based on the stimulus material.

In a quiet neighbourhood, a woman had been murdered at her home when her roommates were supposedly away. Her roommates were two twin brothers (S1 and S2) and another woman (S3). The investigating officer found the skin of the murderer under her fingernails. The officer sent this unknown DNA sample along with DNA from the roommates for DNA profiling. Given below is an image of the bands obtained.



(a) Who is likely to be the murderer? Give a reason to support your answer.
(b) S1 and S2 are twin brothers. What can you conclude about them from the image?

Description	Marks
(a) 0.5 marks each for the following: - S3/woman is the murderer - The DNA profile of S3 has the greatest match/50% match with the DNA obtained on the crime scene.	1
(b) 0.5 marks each for the following: - They could be non-identical twins. - Since their DNA profiles do not match completely with each other they are likely to be non-identical twins.	1

What makes a subjective question good?

A good subjective question should

- **Test a skill or concept that is worth understanding**
- Really test what is intended to be tested
- Be error free
- Be age appropriate
- Be interesting and stimulate thinking
- State what is expected in clear and unambiguous terms
- Use clear, concise and age-appropriate language
- Check for understanding/application in an unfamiliar context
- Use relatable, engaging real life context and not contrived
- **Accompanied with appropriate rubric**

A good subjective question should NOT

- Check for trivial or inconsequential details
- Be taken directly from the wording in textbooks or readings

What is the issue here?

Fill in the blank:

Two equal resistors are connected in parallel.

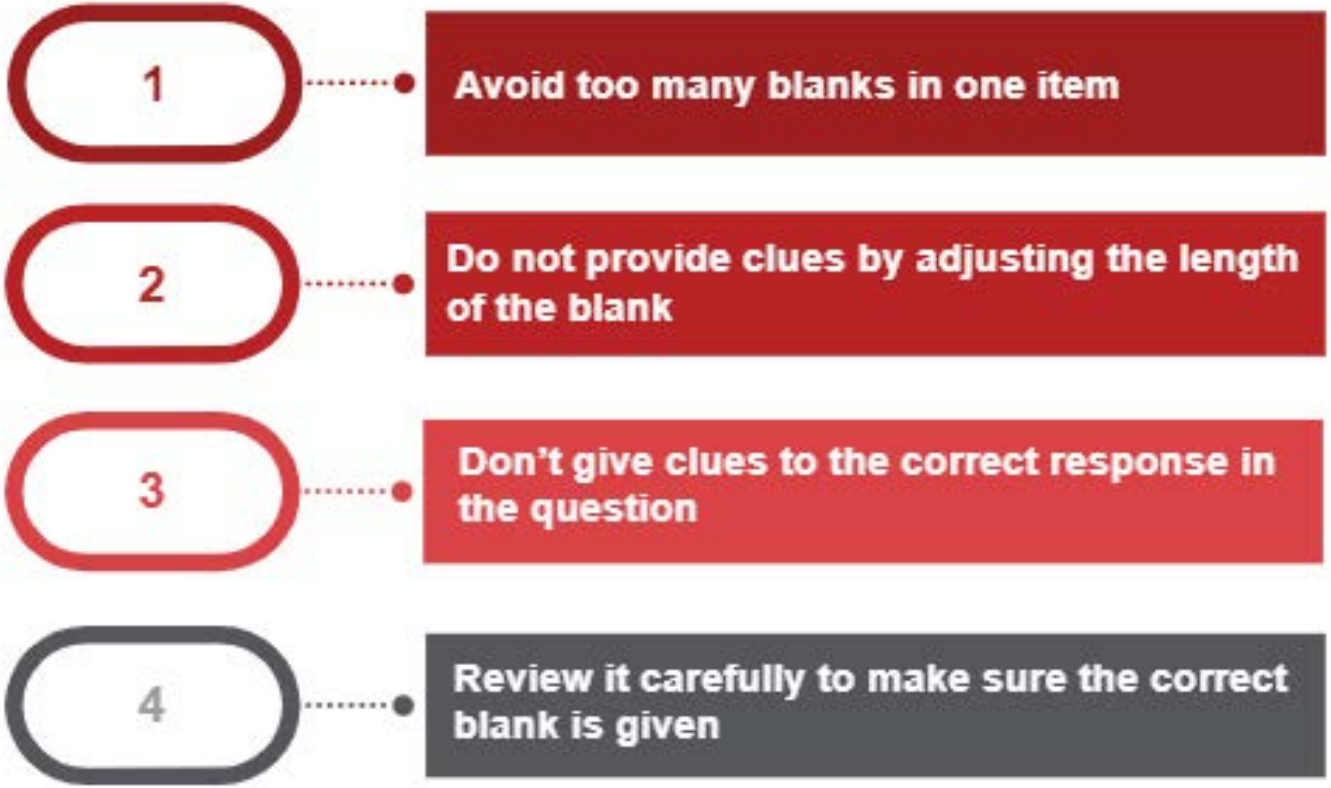
The total resistance of the two resistors is _____ the resistance of the individual resistors.



Student can just answer NOT or NOT EQUAL TO.

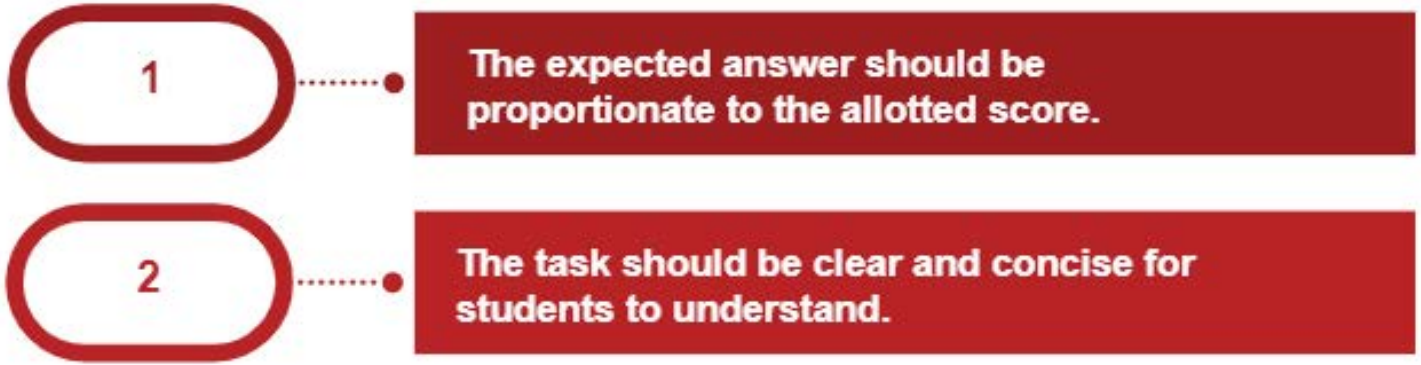
Ensure that your question is assessing as per the intended testing objective.
MCQ is a better choice over fill in the blanks for this case.

Best practices in making subjective questions – Fill in the blanks



Best practices in making subjective questions

Short/long answer questions – Best practices



Best practices in creating good free-response questions

- Assess core concepts/skills
  - Choose competency as per the blueprint of the assessment
  - Define testing objective well
  - Identify cognitive level to assess
- Ensure content is error free (mathematically and language-wise)
- Write stem in simple and easy-to-comprehend language
- Use real-life context
  - Authentic and not contrived
  - Relatable
  - Free from bias
- Award appropriate score and create appropriate rubric for evaluation

Developing a Free-Response Question

To develop constructed response questions, a teacher can follow the basic steps as follows:-

- Determine the **testing objective** to assess.
- Identify the cognitive effort and the length of the target response (solution).
- Select appropriate type of CRQ
- Write clear instructions so the student knows the length and content expected.
- Write the question.
- Create the scoring rubric.

How to make good free-response questions - Process

Carry out checks against such a checklist

Parameters
Correctness of the question
Clear single correct answer
Assesses the concept/skill worth assessing
Focus and clarity in the question text
Effectiveness in assessing the intended testing objective
Appropriateness of a rubric; total marks and distribution of marks
Cognitive skill alignment
Difficulty alignment

Put yourself in shoes of a student and solve it as if seeing the question for the first time.
Also make a note of the time taken to solve!

CRQ Scoring Rubric: (Scoring guide)

A set of scoring/grading/evaluation guidelines to evaluate a student response.

Holistic Rubric

Analytical Rubric

CRQ Scoring Rubric: (Scoring guide)

Please provide your valuable feedback on your dining experience at our restaurant. Tick one of the following

Very good	Good	Poor	Very poor

Holistic Rubric

A single scale with all criteria to be evaluated together.

CRQ Scoring Rubric: (Scoring guide)

Holistic Rubric in Educational Assessments - Example for Writing Task

Holistic Rubric Example

3	Writing has a clear focus and engages the reader in the opening lines. Information is accurate. Transitions help the reader move smoothly from one idea to another. Any errors in structures and/or spelling are minor and infrequent; they do not interfere with communication.↵
2	Writing has a clear opening statement and logical sequence of ideas. The information is accurate. Any errors in structures and/or spelling are minimal and do not interfere with communication.↵
1	Writing includes a purpose for reading in the opening paragraph. The information is accurate. Supporting ideas follow the opening paragraph. Errors in structures and/or spelling may at times distract from the message.↵

CRQ Scoring Rubric: (Scoring guide)

Analytic Rubric

	Very good	Good	Poor	Very poor
Food				
Service				
Ambience				

CRQ Scoring Rubric (Scoring guide)

Analytic Rubric in Educational Assessments - Example for Oral Presentation

	BELOW EXPECTATION	SATISFACTORY	EXEMPLARY
ORGANIZATION	- No evident organization. - Assertions not supported. (0-2)	The presentation has a focus and provides some evidence that supports conclusions. (3-5)	The presentation is carefully organized and provides convincing evidence to support conclusions.
CONTENT	Content lacks accuracy. (0-2)	The content is generally accurate, but incomplete. (5-7)	The content is complete and accurate. (10-13)
STYLE	- Anxiety and discomfort displayed by the speaker. - Presentation is too short, or entire paragraphs are read verbatim from the article. (0-2)	The speaker is generally relaxed & comfortable, presentation is a decent length, and students' own words are used for the summary. (3-6)	The speaker is relaxed & comfortable, presentation is the right length, student demonstrates ability to speak extemporaneously and make eye contact with other members of the class. (7-9)

Importance of a Scoring Rubric

- To evaluate a response in an objective, consistent and fair manner
- To get diagnostic insights on student learning
- To provide accurate feedback
- To help design remedial instruction post assessment

Points related to overall assessment paper

- Ensure the assessment has good balance of questions of varying cognitive levels
- Discriminates students of all scientific abilities
  - Discriminates between low ability students by having easy questions of varying difficulty
  - Discriminates between high ability students by having difficult questions of varying difficulty
- Answer options (keys) are well-distributed
- Ensure the assessment can be completed within the stipulated time if it is timed.

Summary

Good questions have the following features:

- Alignment to the testing objective
- Alignment to the intended difficulty level
  - Some factors that influence a question's difficulty level include the concept level, familiarity with the context, technical terms used, cognitive demand, format of the question, and so on.
- Free of irrelevant difficulties:
  Irrelevant difficulties include: high reading load, grade inappropriate language, tricking, double negatives, unrealism, illogical arrangement of options, bias, stereotyping, unfairness, and so on.
- Free of test-wise factors:
  Test-wise factors include: misaligned cues, clanging, non-parallel options, overlapping options, absurd options, specific or vague determiners.
- Free of factual errors