

APPENDIX-I

Akankshya Sunani

Biological Science

Achievement Test

(BSAT-1)

(English Version)

Please fill the following personal details:

Date: _____

Name _____

Age _____ Sex: Male ☐ Female ☐

Class _____ School _____

Town/Village _____

INSTRUCTIONS

- There are seven questions containing 15 marks. Complete them within one hour.
- Answer them honestly as per your experience and reflection.
- Put tick (✓) mark in appropriate boxes.
- All you have to answer is what is true for you.
- You have to share your thought and point of views while answering the questions.
- After answering the questions, go through this quick reflection.

A quick reflection

- The question/questions you found most difficult to answer
- The question/questions you found most easy to answer
- Rate your performance in this topic (out of 10)

1. According to your understanding and experience, which definition best suits for the term “adolescence”? (1)

The period of life, when the body and mind undergo several changes including a broader spectrum of physical, cognitive, emotional, and social development leading to reproductive maturity ☐

The time period during which teen boys and girls attain sexual maturity and become capable of reproduction ☐

2. What are the vital changes you mark in your teen male classmates (adolescent boys)? (2)

the region below the waist becomes wider ☐ broader shoulders ☐

growth of facial hair i.e. moustache and beard ☐ wider chests ☐

larger voice box or Adam’s apple ☐

3. You have seen Adam’s apple (larger voice box seen as a protruding part of the throat) in- (1)

Baby boys ☐ Adolescent boys ☐ Girls ☐ Both boys and girls ☐

Adult males ☐ Adolescent girls ☐

4. What is the difference between adolescence and puberty according to you? (2)

5. What are some common changes you experience/observe both in boys as well as in girls during adolescence period? (4)

increased activity of sweat gland ☐ growth of hair in your armpit ☐

increased activity of sebaceous glands ☐ growth of tiny hair in pubic region ☐

pimples and acne on your face ☐ Mental and Emotional Changes ☐

_____Any other changes you notice,

6. At the onset of puberty, girls experience their first menstruation. The term given to the first menstrual flow in girls is _____(1)

7. Remember about your childhood male/female friend who is still your friend. List out some of the physical/behavioral/social/emotional changes you have been observing in him/her recently? (4)

APPENDIX-II

Akankshya Sunani

Biological Science

Achievement Test

(BSAT-2)

(English Version)

Please fill the following personal details:

Date: _____

Name _____

Age _____ Sex: Male ☐ Female ☐

Class _____ School _____

Town/Village _____

INSTRUCTIONS

- There are eight questions containing 15 marks. Complete them within one hour.
- Answer them honestly as per your experience and reflection.
- Put tick (✓) mark in appropriate boxes.
- All you have to answer is what is true for you.
- You have to share your thought and point of views while answering the questions.
- After answering the questions, go through this quick reflection.

A quick reflection

- The question/questions you found most difficult to answer
- The question/questions you found most easy to answer
- Rate your performance in this topic (out of 10)

1. According to your understanding and experience, which definition best suits for the term “puberty”? (1)

The period of life, when the body and mind undergo several changes including a broader spectrum of physical, cognitive, emotional, and social development leading to reproductive maturity ☐

The period during which teen boys and girls attain sexual maturity and become capable of reproduction ☐

2. What are the vital changes you mark/heard in your teen female classmates (adolescent girls)? (2)

the region below the waist becomes wider ☐

Development of breasts ☐

growth of facial hair i.e. moustache and beard ☐

voice become high pitched ☐

larger voice box or Adam’s apple ☐

menstruation cycle starts ☐

3. While attaining puberty, Estrogen becomes active in girls and Testosterone becomes active in boys. They bring out many physical changes called as secondary sexual changes which a teen experience for the first time in his/her life. According to you, which sex hormone is active in your body and what are the changes you are experiencing due to its activation? (4)

4. Among your male classmates and female classmates, who has comparatively high-pitched or shrilled voice? (1)

5. What is/are the gland/glands activated during puberty responsible for your acne and pimples? (2)

Thyroid gland ☐

Sweat gland ☐

Sebaceous (oil) gland ☐

Pineal gland ☐

Adrenal gland ☐

6. What are secondary sexual characters developed in girls during puberty? (2)

7. The term given to the phenomena of “Stoppage of menstruation in females” is-_____ (1)

8. What is the difference between adolescence and puberty according to your experience and realization? (2)

APPENDIX-III

Reflective card game

CARD-CONNECT

Game developed by:
Akankshya Sunani

REFLECT

(English Version)

Game designed for: Class-VIII Students, CBSE Board

Topic: REACHING THE AGE OF ADOLESCENCE

INSTRUCTIONS

- Participants must complete each level within the specified time, as the game is strictly time-bound.
- Five groups will participate; members are assigned randomly, and group leaders are chosen by drawing lots (chit-pull method).
- The game consists of three levels which must be played in sequence, without skipping any.
- Each level has its own set of rules, and all members of every group must follow them exactly.
- At the end of each level, participants receive questions and must write their answers in their personal reflection-diary.

LEVEL-1: UNIQUE WINS

Pack of cards will be placed on a table, one term written on each card. A card will be chosen randomly and the term written on it (Card word) will be assigned to all groups. The members have to list out other related words /terms /concepts / phenomena /experience as per their convenience and must be able to justify how these are related with the Card word.

Rules:

1. Focus carefully on the Card word assigned and think about or reflect on related words/ terms/ concepts /phenomena /experience for 2 minutes silently.
2. Now each member of group will write down those things one by one on a paper sheet. 10 minutes will be given for this activity.
3. Now all words /terms /concepts /phenomena /experience of all groups will be compared. The similar or identical words /terms /concepts /phenomena /experience will be cancelled out while the unique/ dissimilar/different/new ones (Unique points) will be counted. Each of the Unique points will give you five stars.
4. If the group member/members will be able to justify the relation between Card word and Unique point(s), they will be assigned extra three stars as bonus.
5. If a member of other group is able to justify, then that group will be given two stars as pass bonus.
6. The group with the greatest number of stars will win.

Questions for each member

1. How many words/terms/concepts/phenomena/experience you thought within 2 minutes? Name them.
2. Are you a contributor of unique words?
3. In this activity, which word/words were unique and how they were related to Card word? Justify.

<p>1. ADOLESCENCE</p> 	<p>2. PUBERTY</p> <p>Puberty:</p> 	<p>3. METAMORPHOSIS</p> 
<p>4. THYROID GLAND</p> 	<p>5. SECONDARY SEXUAL CHARACTERS</p> 	<p>6. SEX HORMONE</p> 
<p>7. TEEN AGE</p> 	<p>8. MENSTRUATION</p> 	<p>9. SEX CHROMOSOMES</p>  <p>sex chromosomes</p>

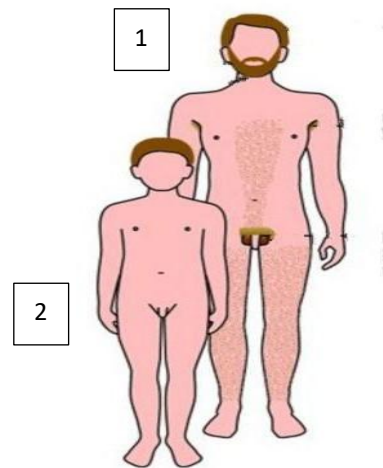
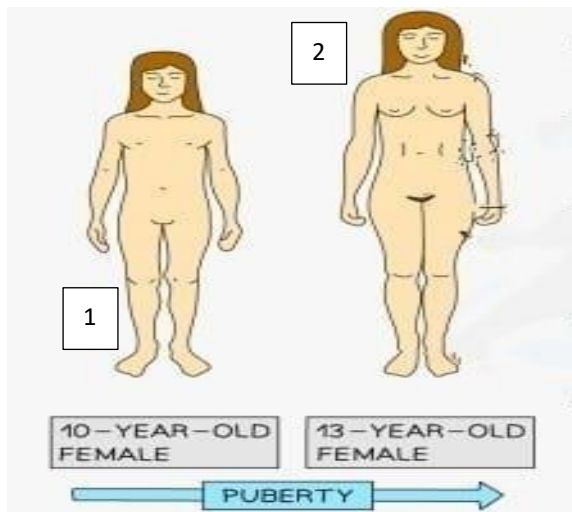
REFLECTIVE CARDS

LEVEL-2: OBSERVE AND DISCOVER

Each card with two images (marked as 1 & 2) will be provided to each group. Members have to observe the cards mindfully and discover differences between 1 and 2. One difference gives two stars. Group with highest number of stars will win.

Rules:

1. 3 minutes will be given to observe the card.
2. 5 minutes will be given to reflect upon it and have group discussion. Members can write down or point out their own idea in a rough sheet.
3. 10 minutes will be given to jot down the differences in paper sheet.



Questions for each member

1. What have you contributed to this team today? In which way you helped your group?
2. What was the most interesting moment for you in today's activity?
3. Are you learning new things during this game?

LEVEL-3: FAST will be FIRST

Cards with number and Cards with categories will be there. Members have to list down the names on a sheet. After that, group leader needs to show the sheet on one hand and raise another hand. The group which will do the task fast with correct answers, will get full points (5 stars). For 5-6 rounds this game will go on. Group with highest number of stars will win.

Rules:

1. Group leader will send a blind folded member from the group to choose a number card from pack of cards and a Category card from a pack of card.
2. They have to wait until every group is assigned with a number card and category card.
3. At the same time blind folds will be opened and the members will reveal their number card and category card to their respective group.
4. Accordingly rest of the members will list the names falling under the category up to numbers assigned to them.
5. Group finishing the activity fast will be winner.

N U M B E R	TWO	THREE	FOUR	ONE	THREE
C A T E G O R Y	Hormone(s)	Secondary sexual characters (male)	Secondary sexual characters (female)	Healthy food name(s)	Endocrine gland(s)

Questions for each member

1. What was your contribution to the team today?
2. What you learnt today?
3. Will this game help you to think, evaluate and examine about your participation as a group member?

APPENDIX-IV

RTIESS: Reflective Thinking Instrument for Elementary School Students (Can,2014)

Name:

Name of your school:

Class:

Sex:

Age:

Date:

This form is designed to understand your opinions and feelings regarding your reflection. Please respond honestly. There are no right or wrong answers. Please read each statement carefully and select the response that best represents your opinion and this shows how much you agree or disagree. Mark your response with a tick (✓). Use the following scale:

| Key: 1- Strongly Disagree (SD) | 2- Disagree (D) | 3- Neutral (N) | 4- Agree (A) | 5- Strongly Agree (SA) |

Sl. No.	ITEMS	RATING				
		1 SD	2 D	3 N	4 A	5 SA
1	I can analyze a question/problem according to my own experience and understanding.					
2	I love to ask questions in class whenever I find some concept difficult or more interesting.					
3	I evaluate that the learned things in the class are associated with my life or not.					
4	I think about how I can improve the class activities and my performance in answering/solving the question/problem.					

5	I try to find a beter way of concept understanding by questioning my friends' answer.					
6	I try to improve my answer in a beter way by evaluating again and again.					
7	While answering/solving the question/problems in biology I re-think and re-examine.					
8	While answering/solving a question/problem, I ask myself new questions to find different ways of answering/solving.					
9	When I read a question/problem, I think what knowledge is needed to solve the question/problem.					
10	When I read the question/problem, I ask myself questions to determine what is given and what exact answer to write.					
11	I Express my thoughts clearly and confidently about anything without hesitation.					
12	I criticize my success or failure after each exam.					
13	I can guess easily the difficulties when I answer a question or solve a problem.					
14	I relate the textbook things with my own life and the world around me.					
15	Before starting or deciding any activity, I think and plan how to do, what to do and how to start.					

APPENDIX-V

PT-GBL: PERCEPTION TOWARDS GBL

Akankshya Sunani

Booklet of Perception
Towards Game Based
Learning

PT-GBL

(English Version)

Please fill the following personal details: Date: _____

Name _____

Age _____ Sex: Male ☐ Female ☐

Class _____ School _____

Town/Village _____

INSTRUCTIONS

- In this form there are twenty-five statements to understand your opinions and feelings regarding your reflection on Game Based Learning.
- The statements in this scale have five options **1- Strongly Disagree (SD), 2- Disagree (D), 3- Neutral (N), 4- Agree (A) and 5- Strongly Agree (SA)**
- Among these 5 possible degrees to each statement, you have to select the response that best represents your opinion. You should put tick mark (✓) in appropriate box and this shows how much you agree or disagree.
- There are no “right” or “wrong” answers because people have the right to their own views. All you have to do is rate what is true for you.
- It is best to say what you really think and to give the first answer that comes to you and not spend too much time on any one question.
- Answer every item one way or other. Don't skip any item.
- Your information will be kept confidential.

CRITERIA	ITEMS	RATINGS				
		1 SD	2 D	3 N	4 A	5 SA
Goals and objectives of the game	1. The game was thought provoking.					
	2. The game encouraged student interaction.					
	3. The card game helps with my recall of concepts/terms.					
Playability and playfulness of the game	4. The game provides opportunity for healthy competition and cooperation.					
	5. The rules of the game provide players with equal conditions for a fair play.					
	6. Playing the game was fun					
Usefulness of the game	7. The game encouraged the players to dig deeper into the subject matter.					
	8. Playing the game is a productive use of time					
	9. Playing the game helped me establish better relationships with the members of the group.					
	10. I would recommend the game to my friends.					
Critical Analysis	11. I can identify the key concepts in biology I learned from the game-based activities.					
	12. I can analyze how the game challenges helped me solve problems in Biology.					
	13. I understand the reasoning behind the decisions I made in the game.					
	14. The feedback provided during the game helped me critically evaluate my understanding.					

	15. I recognize where I went wrong while playing and can correct myself.					
Personal Insight	16. I feel more confident about my learning after reflecting on my game performance.					
	17. I have identified areas where I need to improve after playing the game.					
	18. Playing the game helped me understand my strengths and weaknesses in Biology.					
	19. I can see how my thinking has changed after engaging with the game					
Decision-making	20. The game helped me make thoughtful decisions about solving Biology-related problems.					
	21. I consider multiple perspectives before choosing a solution in the game.					
	22. I understand how my choices in the game affected the outcomes.					
	23. Playing the game made me realize how important it is to justify my decisions.					
	24. I reflect on whether the strategies I used in the game were effective or not and try to make better choices.					
	25. I think about how I could improve my decision-making in future and apply the decision-making strategies from the game to another subject.					

APPENDIX-VI

GBL-ET: GBL-ENGAGEMENT TOOL

Akankshya Sunani

Game Based Learning

Engagement Tool

GBL-ET

(English Version)

Please fill the following personal details: Date: _____

Name _____

Age _____ Sex: Male ☐ Female ☐

Class _____ School _____

Town/Village _____

INSTRUCTIONS

- In this form there are fifteen statements to understand your opinions and feelings regarding your reflection on Game Based Learning.
- The statements in this scale have five options **1- Strongly Disagree (SD), 2- Disagree (D), 3- Neutral (N), 4- Agree (A) and 5- Strongly Agree (SA)**
- Among these 5 possible degrees to each statement, you have to select the response that best represents your opinion. You should put tick mark (✓) in appropriate box and this shows how much you agree or disagree.
- There are no “right” or “wrong” answers because people have the right to their own views. All you have to do is rate what is true for you.
- It is best to say what you really think and to give the first answer that comes to you and not spend too much time on any one question.
- Answer every item one way or other. Don't skip any item.
- Your information will be kept confidential.

Sl. No	ITEMS	RATING				
		1 SD	2 D	3 N	4 A	5 SA
1	I felt excited while participating in game-based learning activities.					
2	I was actively involved during the game-based lessons.					
3	I enjoyed learning biology more through games than traditional methods.					
4	I stayed focused throughout the game-based sessions.					
5	I found the games intellectually challenging and stimulating.					
6	I looked forward to the game-based lessons.					
7	I discussed the game content with my classmates even after class.					
8	I felt more motivated to learn biology during game-based activities.					
9	I remembered more concepts after playing educational games.					
10	I participated more confidently in class when games were used.					
11	I found the game-based activities helpful in understanding complex topics.					
12	I felt a sense of achievement when I succeeded in game-based tasks.					
13	I enjoyed working with peers during game-based group tasks.					
14	I believe game-based learning helped me think critically about biology concepts.					
15	I would like more subjects to use game-based learning in the future.					

INTERVENTION PERIOD PHOTOGRAPHS

