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A Study of Learning Progression in Science of Class IX Students of Balangir District, Odisha

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ABSTRACT

The study was intended to investigate the learning progression of students in Science, learning progression refers to the phenomena of progression in academic achievement of students. Here in this study the progression measured by the basis of the treatment employed to the students. The result basically emphasizes on the mode of the method of teaching given to the students, i.e. one is traditional method and another constructivist. Again, researcher examine the attitude of students towards science in this study using standardize tool. In the present study, Experimental design was employed where Non-equivalent control group design was employed for the study. In the present study effectiveness of independent variable, method of teaching (two levels): (1) Constructivist teaching method (2) traditional teaching method was required to be checked on dependent variable (achievement), thus the researcher decided to use two groups post-test design. Science Attitude Scale developed by Dr. (Mrs) Avinash Grewal (1984) was selected for the present study to measure Attitude towards Science. The researcher selected stratified random sampling technique in the selection of school. One school of Bolangir city was selected for the present study: Odisha Adarsha Vidyalaya, Muribahal for the experiment. Achievement Test and standardise tool for measuring attitude towards Science was employed as tool and data collection. Mean, Standard deviation, Percentile, Coefficient of variation, 2 X 2 factorial designed ANCOVA of unique size were used for the analysis of data. The finding from the research are The Learning Progression of student taught trough the Constructivist Approach was higher than the students taught through the Traditional Method of Teaching, The Attitude towards Science of students taught trough the Constructivist Approach was nearly similar to the students taught through the Traditional Method of Teaching, There is a significant effect of Treatment (Constructive Teaching) on Achievement in Science Subject of Class IX students as compared to traditional method, There is no significant effect of Gender on Achievement in Science Subject of Class IX students and There is no significant interaction effect of Treatment and Gender on Achievement in Science Subject of Class IX students. From the interpretation of results, we can conclude that The Treatment is effective for the Progress of Student ignoring their Gender. This study will further help all the stake holder of secondary schools including, teacher, policy maker, administrator, etc. to adopt constructivist approach of teaching learning in classroom and to innovate ideas to inculcate scientific attitude among students.

KEY WORDS: Constructivist Approach, Scientific Attitude, Learning Progression

INTRODUCTION

Learning is a process through which child acquire new modes of behavior or change in the existing mode

of behavior. Changes in behavior that are brought by physical maturation or growth do not fall under learning. Learning is what we acquire through efforts after birth. We know, we feel and we do and in three domains (cognitive, affective and psychomotor) of behavior, change occur due to learning. In other words, we can get new knowledge, form attitude and master in skill through learning. In essence of learning, three basic assumptions are held to be true. First, learning can visualize by a change in behavior. Second, the environment shapes behavior. And third, the cause and reinforcement are central to explaining the learning process.

The term learning progression refers to the purposeful sequencing of teaching and learning expectations across multiple developmental stages, ages, or grade levels. The term is most commonly used in reference to learning standards concise, clearly articulated descriptions of what students should know and be able to do at a specific stage of their education. The basic idea is to make sure that students are learning age-appropriate material (knowledge and skills that are neither too advanced nor too rudimentary), and that teachers are sequencing learning effectively and avoiding the inadvertent repetition of material that was taught in earlier grades. Learning progressions (LPs) are a relatively recent approach that aim to support three aspects of education: teaching and learning, assessment, and curriculum design. According to the effectiveness of these three aspects of education may be increased by better coherence, and the LP approach claims to improve coherence by providing frameworks of knowledge and skills called "LP models". these frameworks describe the progression that can be expected of learners through their education. Learning progression approaches are popular and influential across the fields of curriculum development, with discussion being carried out across a number of international contexts suggests that the consideration of the approach is topical. Education is complex and the implementation of the LP approach to teaching and learning, assessment, or curriculum design may have unintended consequences when implemented without consideration of other possible approaches.

Scientific attitude can be defined as, "open mindedness, a desire for accurate knowledge, confidence in procedures for seeking knowledge and the expectation that the solution of the problem will come through the use of verified knowledge". Scientific attitude are the most important outcomes of science teaching. Though some people view the scientific attitude as the by-product of teaching science, yet a majority of the people consider them as equally important as the knowledge aspect. Science should be taught directly and systematically because developing scientific attitude has a number of characteristics features which distinguish it from other attitudes. Science attitude are important because of three important factors. First a child attitude carries a mental state of readiness with it. With a positive attitude, a child will perceive science object, topics, activities and positively. A child, who is unready or hesitant for whatever reason, will be less willing to interact with people and things associated with science. Second, attitudes are not innate or inborn. Contemporary psychologists maintain that attitudes are learned and organised through experience as child develop.

RELATED RESEARCH WORK

Plummer, J. D., & Maynard, L. (2014). *Building a learning progression for celestial motion: An exploration of students' reasoning about the seasons*. *Journal of Research in Science Teaching*, states in his study that the development of a construct map addressing the reason for the seasons, as a subset of a larger learning progression on celestial motion. Five classes of 8th grade students ($N = 38$) participated in a 10-day curriculum on the seasons. We revised a hypothetical season construct map using a Rasch model analysis of students' pre/post-assessments followed by a closer examination of individual student

explanations. Our proposed construct map is consistent with the *Framework for K-12 Science Education* [National Research Council. (2012). *Framework for K-12 Science Education*. Washington, DC: National Academy Press] but includes a more nuanced discussion of critical conceptual and spatial connections. Movement up the construct map begins with learning foundational concepts about the Earth's motion in space and how observational patterns of the Sun relate to temperature changes. Movement into the upper levels of the seasons construct map occurs as instruction supports students in making sense of how the space-based perspective of their location on a spherical Earth can be used to account for observable patterns of change.

Merrit, J. D., Krajcik, J., Shwartz, Y. (2008) *Development of a Learning Progression for the Particle Model of Matter*. In his study he states that, Prior research indicates that one of the most difficult concepts for students to understand is that of the particle nature of matter. The How can I smell things from a distance? chemistry unit takes the approach of building students' ideas through the construction and revision of models. The purpose of this study is to describe the changes in students' understanding of the particle nature of matter as they were engaged in an eight-week model-based curriculum. One teacher and her two 6 th-grade classes in a midwestern school district were the focus of the study. Data sources include pre- and posttests, students' artifacts, and video recordings of the curriculum enactment, including students' creation of models of various phenomena. Results from this study were used to help develop a learning progression for the particle nature of matter.

Ojha, N.C., Arya, R. & Shekhar, R. (2015) in their study Constructive approach and traditional approach of teaching english to class vi in terms of achievement: a comparative study. *Pedagogy of Learning,*The objectives of the study were to find the "*effectiveness of the constructivist approach in terms of the achievement in English"*. The two independent variables were the treatment and the Learning Style of the individual learner. A sample 80 students were taken for the study from Bhopal city, Madhya Pradesh. Post-test control group design was employed for the study. The findings of the study were constructivist approach is effective in terms of the students' achievement in English , gender did not produce significant differential effect on the students' achievement in English , there was no significant interactional effect of Treatment and Gender students' achievement in English , there was no significant effect of Style of Learning on students' achievement in English , there was no significant interactional effect of Treatment and Style of Learning on the achievement in English.

Dogra, B. (2015). *Constructivist classroom activities for Biology learning.* In his study he states that - Constructivism is buzz word widely used in paradigm of teaching-learning. Constructivism emphasises how the learner constructs knowledge from experience, which is unique to each individual. In the present paper the areas of discussion are 1) historical background of constructivism and its importance. 2) Role of mentor and learner in constructivist science classroom. 3) An attempt is made to prepare a lesson plan for science teachers based on 5E's model (one of the models of constructivism) on the topic 'Images formed by concave lenses. This sample lesson plan will facilitate the science teachers in the implementation of constructivism in their classroom.

Kounsar (2016) had conducted a study on "*Attitude towards teaching of arts and science teachers*". The present study is a modest effort to compare male and female secondary school teachers on various dimensions of attitude.

Tamboli (2014) had conducted "*A study of religiosity, modernization, science attitude among educated mothers of secondary school children*". A total of 315 educated mothers and their children were selected purposefully. The investigator among other things in this study finds that educational level of mothers is

not essentially a dominant factor in religiosity and that as the educational level of the mothers increases their modernization also increases. The educational level of mothers is not a dominant factor in science attitude. The educational levels of mothers did not play a dominant role in the development of science attitude of their children.

JUSTIFICATION OF THE STUDY

Learning Progression through Learning Analytics are powerful tool in this 21st century for training and developing the abilities as well as bringing up the human talents in a suitable mechanism to create educational opportunities. Thus, study will helpful to understand the Learning Progression through the effectiveness of Constructivism in students learning outcomes in biological science at class IX level. Constructivism will enable a wide range of experience and knowledge so that students can relate biological science to their own and other world of experience.

OBJECTIVES

The present study has the following objectives

1. To study the learning progression in science of class ix students of Balangir district.
2. To study the attitude towards science of class ix students of Balangir district.
3. To study effect of treatment, gender and their interaction on achievement in science of class ix students of Balangir district by taking their previous year achievement score in science as covariate.

HYPOTHESIS

1. There will be no significant effect of Treatment on Achievement in Science of Class IX students when their previous year score of Achievement in Science was taken as covariate
2. There will be no significant effect of Gender on Achievement in Science of class IX students when previous years' Science score is taken as covariate
3. There will be no significant interaction of Treatment and Gender on Achievement in Science of class IX students when previous years' Science score is taken as covariate

OPERATIONAL DEFINITION

1. **EFFECTIVENESS:** The ability to be successful and produce the intended results.
2. **LEARNING OUTCOMES:** They are the statements that describes the knowledge or skills students should acquire by the end of a particular course or program.
3. **ATTITUDE TOWARDS SCIENCE:** This is an aspect of a personality that requires rationality, inquisitiveness, and a need to investigate results.
4. **SECONDARY LEVEL:** Students belonging to 14 years to 16 years generally of class IX and 10^{th}.

DELIMITATIONS OF THE STUDY

The study will be conducted under the following constraints-

1. The students were selected randomly from the selected one school of Balangir District.
2. The study particularly framed in one location only
3. Only 45 days treatment was provided
4. Self-made tool is used for the achievement test

METHODOLOGY

In the present study, Experimental design was employed where Non-equivalent control group design was employed for the study.

DESIGN

The experimental-design is most important in experimental research work, in which conclusions can be derived from the observed data through systematic analysis. Thus, the selection of the experimental strategy was planned systematically. In the present study effectiveness of independent variable, method of teaching (two levels): (1) Constructivist teaching method (2) traditional teaching method was required to be checked on dependent variable (achievement), thus the researcher decided to use two groups post-test design. Science Attitude Scale developed by Dr. (Mrs) Avinash Grewal (1984) was selected for the present study to measure Attitude towards Science.

SAMPLE

As the present study was experimental one, the researcher had decided to select one school from the population. The researcher selected stratified random sampling technique in the selection of school. One school of Bolangir city was selected for the present study: Odisha Adarsha Vidyalaya, Muribahal for the experiment.

TOOL

The present study used the following tools and measures.

1. Academic Achievement Test.
2. A test of measuring Attitude towards Science.

The Achievement test in Science was developed by the investigator. Science Attitude Scale developed by Dr. (Mrs) Avinash Grewal (1984) was selected for the present study to measure Attitude towards Science.

PROCEDURE OF DATA COLLECTION

The data collection was done basically in three ways, that are as follows-

1. Achievement test was conducted to saw the learning progression in science in both the section of class IX. Section A was control group students and section B was experimental in design where controlled group was taught in traditional teaching while experimental group was taught by special content in science (constructivist teaching method). 100 marks questions including MCQs, true-false statements, fill in the blanks questions and match the pair questions. Test was given parallel to both the groups. Tests was evaluated by the researcher and marks were given to each answer paper and data was collected.
2. “Science Attitude Scale” developed by Dr. (Mrs) Avinash Grewal (1984) was selected for the present study to measure Attitude towards Science. After the detailed about the paper instructed to students of both the sections of class 9 were given responses in 15 minutes. Researcher later evaluate the scoring as per the guidelines and data was collected.
3. The annual examination marks of standard eight of science subjects of the sample, which were collected from the school before the experiment with the permission of the head of the school. Marks were collected for control group and experimental group students. The said scores were considered as the pre-achievement of the sample.

STATISTICAL TECHNIQUE

1. Mean
2. Standard deviation
3. Percentile
4. Coefficient of variation
5. 2 X 2 factorial designed ANCOVA of unique size will be used for the analysis of data.

ANALYSIS AND DISCUSSION

1. The first objective of the investigation was to study the Learning Progression in Science of class IX students of Balangir District of Odisha. The data related to the Learning Progression in Science were collected with the help of administering the Achievement Test in Science developed by the investigator. The maximum marks of Achievement Test in Science were 100. The data were analysed with the help of Mean, SD, Range and Percentiles.

Findings: The Learning Progression of Students of Experimental group is higher than that of Control group students of class IX of Balangir district, Odisha.

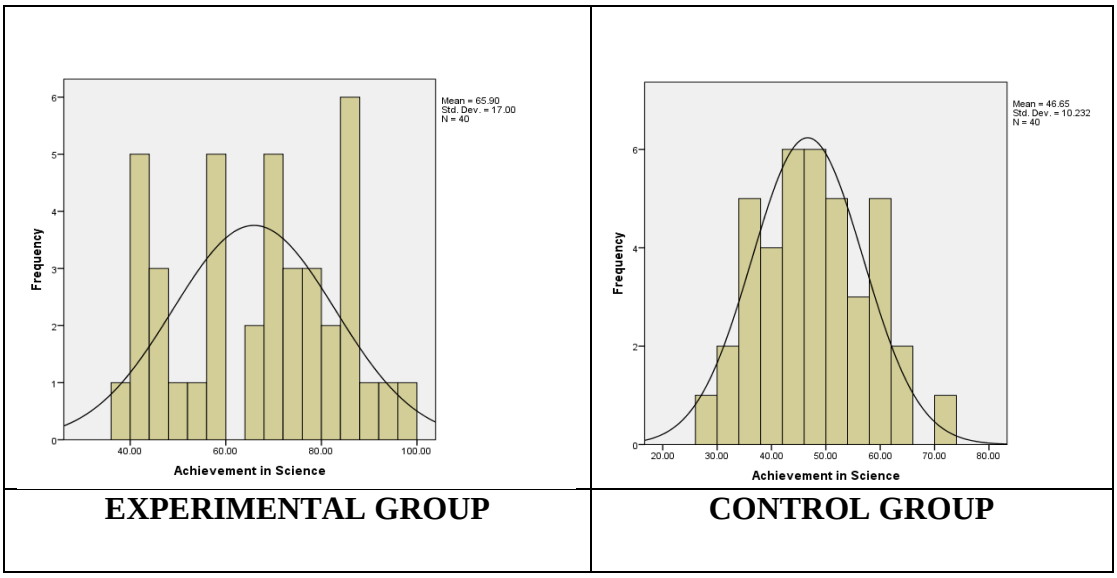

Fig.1: Achievement in Science of Class IX Students of Experimental and Control Group

From the above presentations of the results of the present study, it can be concluded that the students of Experimental Group achieved higher in Science than their counterparts, i.e., the students of Control Group. Therefore, it can be inferred from the result of the present study that Constructivist Approach was more effective than the Traditional Method of Teaching in terms of Achievement in Science. The Learning Progression of students taught trough the Constructivist Approach was higher than the students taught through the Traditional Method of Teaching.

2. The second objective of the investigation was to study the Attitude towards Science among class IX students of Balangir District of Odisha. The data related to the Attitude towards Science were collected with the help of administering the Attitude towards Science Tool (Grewal 1984). The maximum marks of Attitude towards Science Tool were 80. The data were analysed with the help of Mean, SD, Range and Percentiles.

Findings: The Attitude towards Science of Students of Experimental group is nearly Similar to that of Control group students of class IX of Balangir district, Odisha.

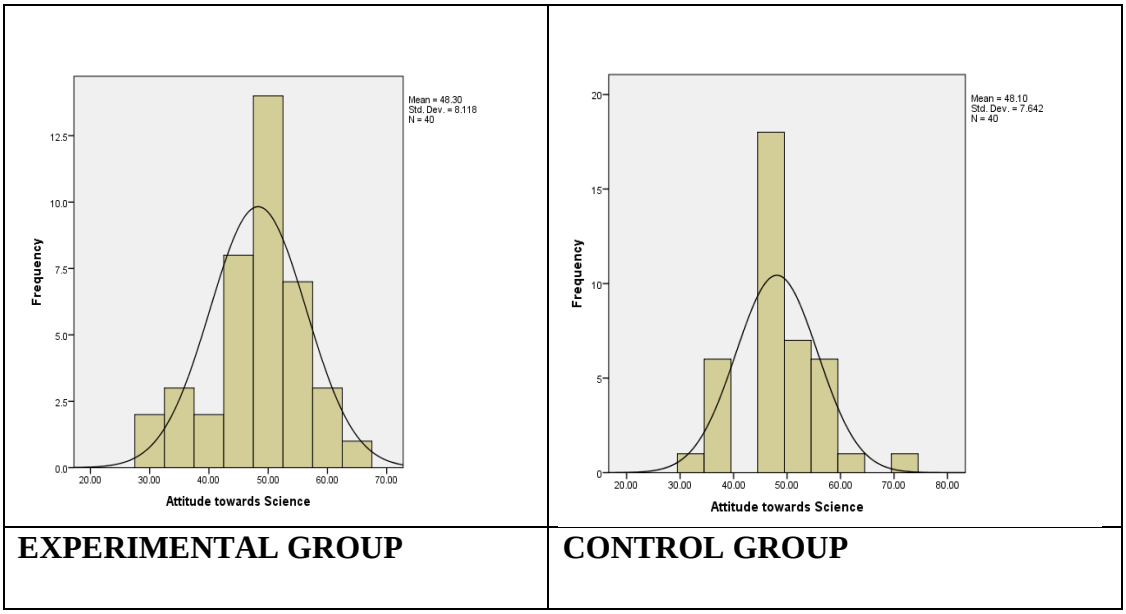

Fig. 2: Attitude towards Science of Class IX Students of Experimental and Control Group

From the above presentations of the results of the present study, it can be concluded that the students of Experimental Group achieved slightly higher in Attitude towards Science than their counterparts, i.e., the students of Control Group, which is negligible. Therefore, it can be inferred from the result of the present study that Constructivist Approach was not effective than the Traditional Method of Teaching in terms of Attitude towards Science. The Attitude towards Science of students taught trough the Constructivist Approach was nearly similar to the students taught through the Traditional Method of Teaching.

3. The third objective was to study the effect of Treatment, Gender and their interaction on Achievement in Science of Class IX students by taking their previous year Achievement in Science as covariate. Treatment and Gender were two independent variables. Treatment had two levels, namely, Constructivist Approach and Traditional Method of Teaching. Gender had two levels, namely, Boys and Girls. The data related to the Achievement in Science Learning Progression in Science were collected with the help of administering the Achievement Test in Science developed by the investigator. The maximum marks of Achievement Test in Science were 100. The Class VIII Scores of Achievement in Science was collected from the school Register and was designated as previous year Achievement in Science, which was taken as covariate. Thus, the data were analysed with the help of 2 X 2 Factorial Design ANCOVA of Unequal Cell Size. The results, interpretations and findings related to each of these above components are presented in Table 1 and 2.

Table 1: Summary of 2 X 2 Factorial Design ANCOVA for Achievement in Science of Class IX Students by Taking Pre-test Scores of Achievement in Science of as Covariate

Sources of Variance	df	SSy.x	MSSy.x	F-Values	Sig.
Treatment	1	8222.10	8222.10	47.54**	0.000
Gender	1	400.94	400.94	2.32	0.132
Treatment X Gender	1	69.17	69.17	0.40	0.529
Error	75	12971.46	172.90		
Total	78	21663.67			

Table 2: Mean and SD for Achievement in Science of Experimental and Control Group

Group	Gender	N	Mean	Std. Deviation
Experimental	Boys	17	69.65	16.496
	Girls	23	63.13	17.192
	Total	40	65.90	17.000
Control	Boys	17	46.94	11.877
	Girls	23	46.43	9.105
	Total	40	46.65	10.232
Total	Boys	34	58.29	18.252
	Girls	46	54.78	16.008
	Total	80	56.27	16.976

Finding 1: There is a significant effect of Treatment (Constructivist Approach) on Achievement in Science of Class IX students as compared to traditional method.
Finding 2: There is no significant effect of gender on achievement in science of class IX students.
Finding 3: There is no significant interactional effect of Treatment and Gender on achievement in Science of class IX students.

MAJOR FINDINGS

The finding from the research are The Learning Progression of student taught trough the Constructivist Approach was higher than the students taught through the Traditional Method of Teaching, The Attitude towards Science of students taught trough the Constructivist Approach was nearly similar to the students taught through the Traditional Method of Teaching, There is a significant effect of Treatment (Constructive Teaching) on Achievement in Science Subject of Class IX students as compared to traditional method, There is no significant effect of Gender on Achievement in Science Subject of Class IX students and There is no significant interaction effect of Treatment and Gender on Achievement in Science Subject of Class IX students. From the interpretation of results, we can conclude that The Treatment is effective for the Progress of Student ignoring their Gender.

IMPLICATIONS

The implications of this study are for direct class room teaching as well as for the teacher education programme. Some of the major implications visualized are as follows.

- The strategies used, in this study, may be used by the class room teacher in teaching different subjects other than Science.
- The components used in this study may be used, separately or combined, for teaching Subjects other than Science.
- The lessons developed, in this study, may be used by the teacher of Science.
- Teacher should be trained to develop instructional material on the lines of the lesson plans presented in this study.
- Teachers should be trained to teach through the constructivist approach. These lesson plans may be used as models for imparting training to the teachers as well as to the teacher-educators.

SUGGESTIONS FOR FURTHER STUDIES

Taking into Consideration the Present studies and its findings, the following studies may further be conducted

- The study may be conducted by taking the different samples of different classes of different level taking into consideration the other cognitive and psychomotor variables.
- Studies may be conducted in e-content, developed by different agencies for starting its effectiveness.
- Studies may be conducted for making comparisons of different methods by taking selected variables.
- Studies may be conducted in the area of inclusive education and studying the effectiveness of this approach in terms of Cognitive and other demographic variables.
- Studies may be conducted Including learning style as an independent variable with Gender and Treatment.
- Studies may be conducted using different treatments other than Constructive approach.
- Inclusion of other mental health variables such as, self-esteem, self-concept etc. may enrich the understanding of the phenomenon, presently studied.
- Cross-cultural differences and regional differences can be studied in relation to the present problem since the cultural differences may influence the shaping of one's gender role identity as well as its impact on achievement performance.
- Inclusion of other socio-economic levels like lower and higher income groups may bring interesting differences in the obtained results, since gender role development and its operation may be different for these social groups.
- Study habit is an important factor while studying the academic achievement of an individual. There are many researches works available taking the study habit and academic performance together.

CONCLUSION

This study attempts to know the effect of Constructive Approach on Student's Learning, to calculate their progress in learning, to know if there is any deference in their Attitude towards Science and if Gender of a student affects its achievement or not. Constructivist approach is effective in improving the achievement in the subject concerned. It was also experienced during the study that this approach was not only effective in cognitive development but also effective in interpersonal development. From the above finding it was concluded that the Treatment that means Constructive Approach is effective in increasing Student's achievement in Science but it has no effect on their attitude towards Science. Gender also plays a very negligible role in case of Student's Achievement in Science. National Curriculum Framework (NCF). prepared by working group of NCERT (2008). does also highlights the importance of introducing constructivist approach in education system. Constructivism is basically a theory based on observation and scientific study — about how' people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. Thus, learning progression through Constructivism impact in a great function in school curriculum and reflected through students' performances now a days.

ACKNOWLEDGEMENT

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DISCLOSURE STATEMENT
No potential conflict is reported.

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APPENDIX – 1

ACHIEVEMENT TEST
All questions are compulsory
TOTAL MARK- 50 **TIME- 1 HR**

Q1. **Fill in the blanks** **10M**

a. Cell wall is made up of _____.
b. _____ is called as the power house of the cell.
c. _____ is absent in plant cell.
d. _____ is called as the unit of life.
e. _____ is present in chloroplast which gives green colour to the leaf as well as helps in photosynthesis.

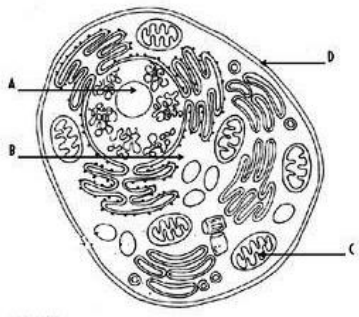
Q2. **Match the following.** **10M**

A	**B**
Ribosome	Dictyosome
Plant cell	Protein Synthesis
Suicidal bag	Mitochondria
Chromosome	Cytoplasm
Cristae	Lysosome
DNA & Histone protein	

Q3. **One word answer** **5M**

a. Who discovered cell?
b. Who discovered nucleus?
c. Which membrane covered all the cell organelles inside the cell.

Q4. **Lebel the diagram** **5M**



Q5. **Multiple choice question** **10M**

a. Who described cell theory?

1. Robert Brown 3. Purkinji
2. Robert Hooke 4. Scheliden and Schwann

b. Which of the following is a multicellular organism?

1. Virus 3. Blue Green Algae
2. Plant 4. Amoeba

c. The process by which various substances are usually transported through plasma membrane

1. Diffusion 3. Osmosis
2. Active transport 4. All of the above

d. The stage of cell division where two chromatids are clearly visible

1. Anaphase 2. Metaphase
3. Prophase 4. Telophase

e. Which nitrogen bases are present in DNA molecule?

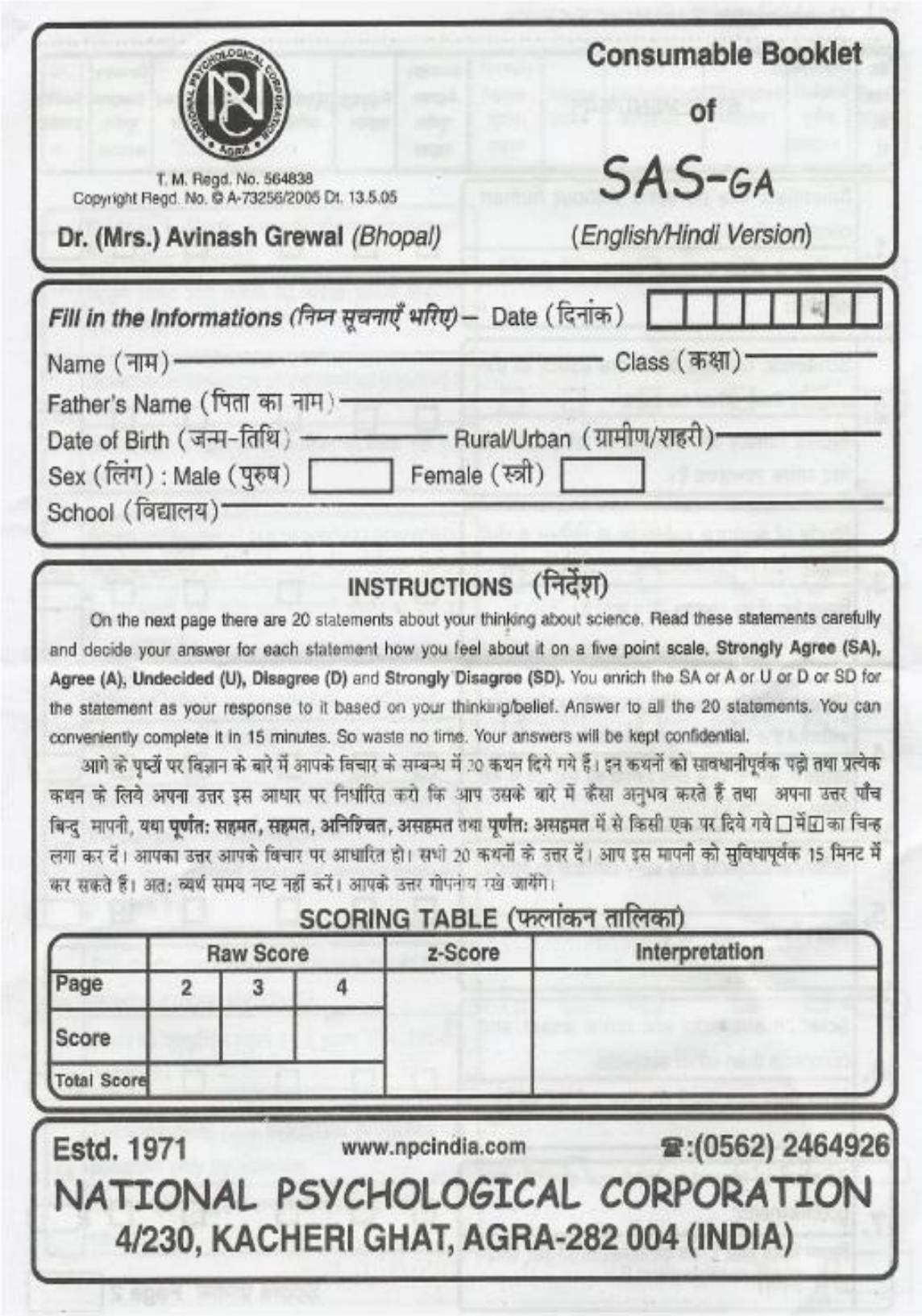
a. Adenine
b. Guanine
c. Uracil
d. Cytosine
e. Thymine

1. a,b,c,d 3. a,b,c,e
2. a,c,d,e 4. a,b,d,e

Q.6 **write any five differences between Plant Cell and Animal Cell with labelled diagram. 10M**

APPENDIX – 2

ATTITUDE TOWARDS SCIENCE SCALE DEVELOPED BY DR. (MRS) AVINASH GREWAL (1984)



Consumable Booklet

of

SAS-GA

(English/Hindi Version)

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Dr. (Mrs.) Avinash Grewal (Bhopal)

Fill in the Informations (निम्न सूचनाएँ भरिए) – Date (दिनांक) | | | | | | | | |

Name (नाम) _____ Class (कक्षा) _____

Father's Name (पिता का नाम) _____

Date of Birth (जन्म-तिथि) _____ Rural/Urban (ग्रामीण/शहरी) _____

Sex (लिंग) : Male (पुरुष) ☐ Female (स्त्री) ☐

School (विद्यालय) _____

INSTRUCTIONS (निर्देश)

On the next page there are 20 statements about your thinking about science. Read these statements carefully and decide your answer for each statement how you feel about it on a five point scale, **Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D)** and **Strongly Disagree (SD).** You enrich the SA or A or U or D or SD for the statement as your response to it based on your thinking/belief. Answer to all the 20 statements. You can conveniently complete it in 15 minutes. So waste no time. Your answers will be kept confidential.

आगे के पृष्ठों पर विज्ञान के बारे में आपके विचार के सम्बन्ध में 20 कथन दिये गये हैं। इन कथनों को सावधानीपूर्वक पढ़ो तथा प्रत्येक कथन के लिये अपना उत्तर इस आधार पर निर्धारित करो कि आप उसके बारे में कैसा अनुभव करते हैं तथा अपना उत्तर पाँच बिन्दु मापनी, यथा **पूर्णतः सहमत, सहमत, अनिश्चित, असहमत** तथा **पूर्णतः असहमत** में से किसी एक पर दिये गये ☐ में ☑ का चिन्ह लगा कर दें। आपका उत्तर आपके विचार पर आधारित हो। सभी 20 कथनों के उत्तर दें। आप इस मापनी को सुविधापूर्वक 15 मिनट में कर सकते हैं। अतः व्यर्थ समय नष्ट नहीं करें। आपके उत्तर गोपनीय रखे जायेंगे।

SCORING TABLE (फलांकन तालिका)

	Raw Score			z-Score	Interpretation
Page	2	3	4		
Score					
Total Score					

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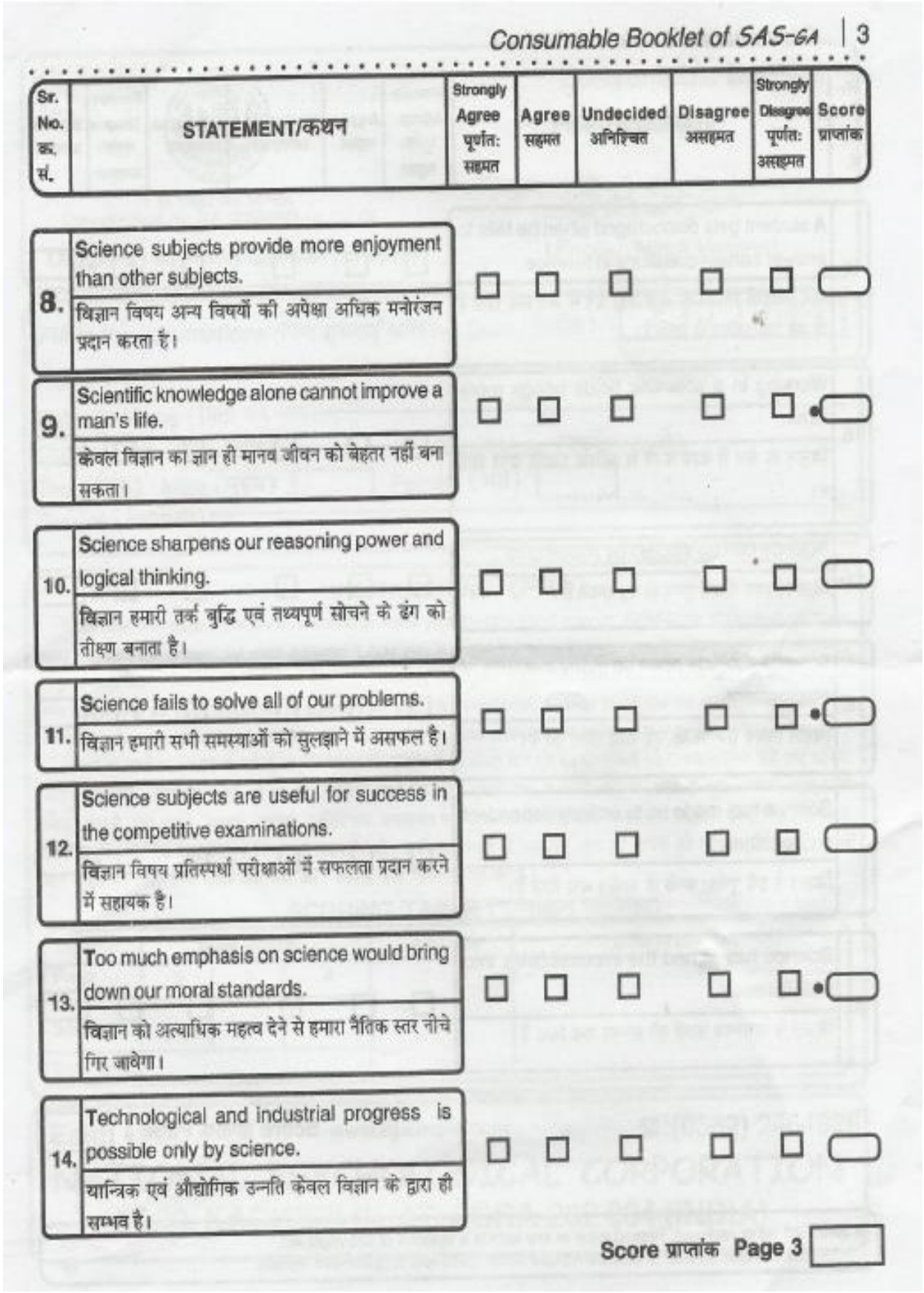
NATIONAL PSYCHOLOGICAL CORPORATION

4/230, KACHERI GHAT, AGRA-282 004 (INDIA)

Sr. No. क्र. सं.	STATEMENT/कथन	Strongly Agree पूर्णतः सहमत	Agree सहमत	Undecided अनिश्चित	Disagree असहमत	Strongly Disagree पूर्णतः असहमत	Score प्राप्तांक
1.	Scientists are persons without human considerations. वैज्ञानिक वे व्यक्ति हैं जिनको मानवता का कोई विचार नहीं होता।	☐	☐	☐	☐	☐	⬭
2.	Schientific careers are more useful to the society than other careers. वैज्ञानिक व्यवसाय अन्य व्यवसायों की अपेक्षा समाज के लिए अधिक लाभदायक है।	☐	☐	☐	☐	☐	⬭
3.	Study of science subjects is rather a dull affair. विज्ञान विषयों का अध्ययन नीरस कार्य है।	☐	☐	☐	☐	☐	⬭
4.	Other subjects cannot be properly understood without the knowledge of science. विज्ञान के ज्ञान के बिना अन्य विषयों को सही ढंग से नहीं समझा जा सकता है।	☐	☐	☐	☐	☐	⬭
5.	Science subjects are very difficult to study. विज्ञान विषय अध्ययन की दृष्टि से बड़ा कठिन विषय है।	☐	☐	☐	☐	☐	⬭
6.	Science subjects are more exact and complete than other subjects. विज्ञान विषय अन्य विषयों से अधिक सही एवं पूर्ण है।	☐	☐	☐	☐	☐	⬭
7.	Science is bound to lead our society into godlessness. विज्ञान विषय हमारे समाज को नास्तिकता की ओर अवश्य ही ले जायेगा।	☐	☐	☐	☐	☐	⬭

Score प्राप्तांक Page 2 ☐



Sr. No. क्र. सं.	STATEMENT/कथन	Strongly Agree पूर्णत: सहमत	Agree सहमत	Undecided अनिश्चित	Disagree असहमत	Strongly Disagree पूर्णत: असहमत	Score प्राप्तांक
8.	Science subjects provide more enjoyment than other subjects. विज्ञान विषय अन्य विषयों की अपेक्षा अधिक मनोरंजन प्रदान करता है।	☐	☐	☐	☐	☐	⬭
9.	Scientific knowledge alone cannot improve a man's life. केवल विज्ञान का ज्ञान ही मानव जीवन को बेहतर नहीं बना सकता।	☐	☐	☐	☐	☐	⬭
10.	Science sharpens our reasoning power and logical thinking. विज्ञान हमारी तर्क बुद्धि एवं तथ्यपूर्ण सोचने के ढंग को तीक्ष्ण बनाता है।	☐	☐	☐	☐	☐	⬭
11.	Science fails to solve all of our problems. विज्ञान हमारी सभी समस्याओं को सुलझाने में असफल है।	☐	☐	☐	☐	☐	⬭
12.	Science subjects are useful for success in the competitive examinations. विज्ञान विषय प्रतिस्पर्धा परीक्षाओं में सफलता प्रदान करने में सहायक है।	☐	☐	☐	☐	☐	⬭
13.	Too much emphasis on science would bring down our moral standards. विज्ञान को अत्याधिक महत्व देने से हमारा नैतिक स्तर नीचे गिर जावेगा।	☐	☐	☐	☐	☐	⬭
14.	Technological and industrial progress is possible only by science. यान्त्रिक एवं औद्योगिक उन्नति केवल विज्ञान के द्वारा ही सम्भव है।	☐	☐	☐	☐	☐	⬭

Score प्राप्तांक Page 3 ☐

Sr. No. क्र. सं.	STATEMENT/कथन	Strongly Agree पूर्णत: सहमत	Agree सहमत	Undecided अनिश्चित	Disagree असहमत	Strongly Disagree पूर्णत: असहमत	Score प्राप्तांक
15.	A student gets discouraged when he fails to answer certain questions in science. यदि विद्यार्थी विज्ञान के कुछ उत्तर देने में असफल रहता है तो वह हतोत्साहित हो जाता है।	☐	☐	☐	☐	☐	⬭
16.	Working in a scientific fields brings more fame. विज्ञान के क्षेत्र में कार्य करने से अधिक ख्याति प्राप्त होती है।	☐	☐	☐	☐	☐	⬭
17.	Science can be studied by males only. विज्ञान विषय केवल पुरुष ही पढ़ सकते हैं।	☐	☐	☐	☐	☐	⬭
18.	Science subjects open up many avenues of employment. विज्ञान विषय रोजगार के कई रास्ते खोल देते हैं।	☐	☐	☐	☐	☐	⬭
19.	Science has made us to entirely dependent on machines. विज्ञान ने हमें पूर्णत: यन्त्रों के अधीन बना दिया है।	☐	☐	☐	☐	☐	⬭
20.	Science has turned the impossibilities into possibilities. विज्ञान ने असम्भव कार्यों को सम्भव बना दिया है।	☐	☐	☐	☐	☐	⬭

Score प्राप्तांक Page 4 ☐