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Session 5-Who am I?

LEARNING OBJECTIVES

By the end of this session learners will

- examine and share different aspects that form a part of their identity.

Homework 5.1
My name is:

This is how I look:
(Stick a photo or make a drawing of yourself)

Gender: Age:

What is the best quality about you?

What do you like to do in your free time?

Where do you live?

NOTES

Session 6: My identity

LEARNING OBJECTIVES

By the end of this session learners will

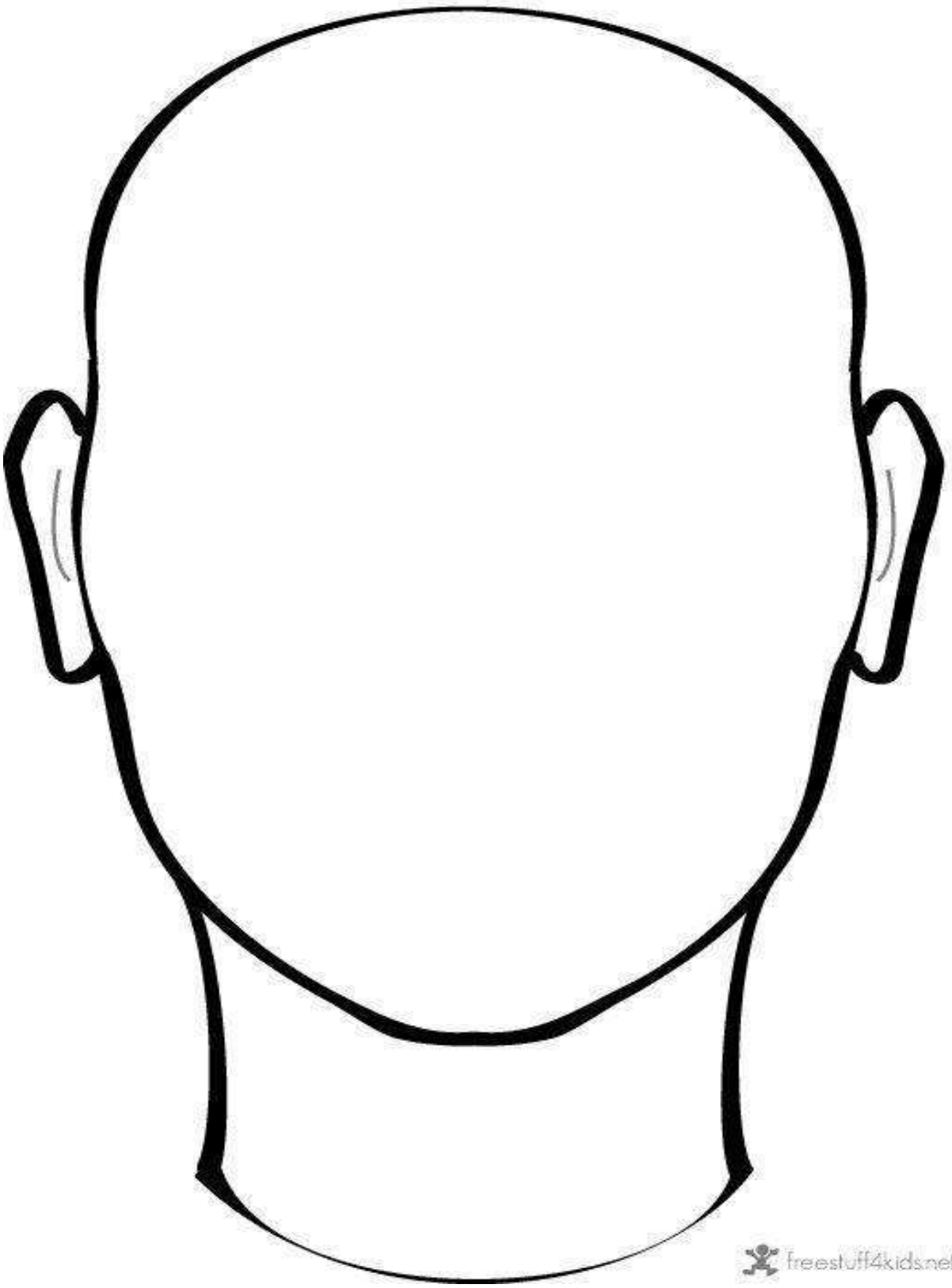
- learn to identify self through metaphors.
- associate self through metaphors and adjectives.

Homework 6.1

Poem: Special You

Your name –
Hairstyle –
The clothes you wear –
Your thoughts, beliefs and feelings you share –
Your town, your state and the country you grew –
Your age, your religion and your gender, too –
The family, friends and relatives around you –
Your likes, dislikes and the work you do –
Your interests, goals and hobbies too –
All these things together make the special you -

Task 6.1 Here is the outline of a face. Use this to represent your identity. You could draw metaphors or use adjectives.



Session 7: Common ground

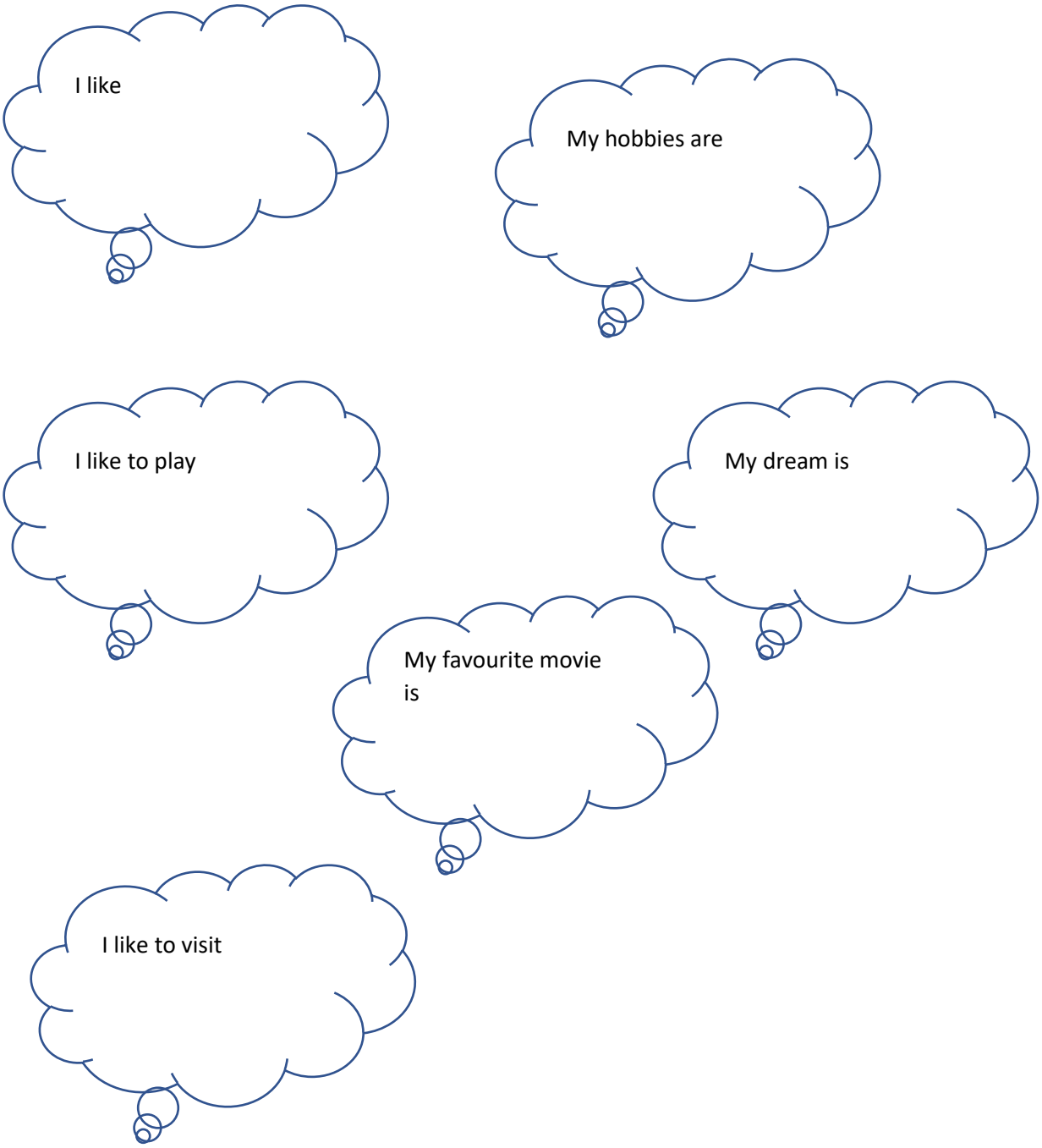
LEARNING OBJECTIVES

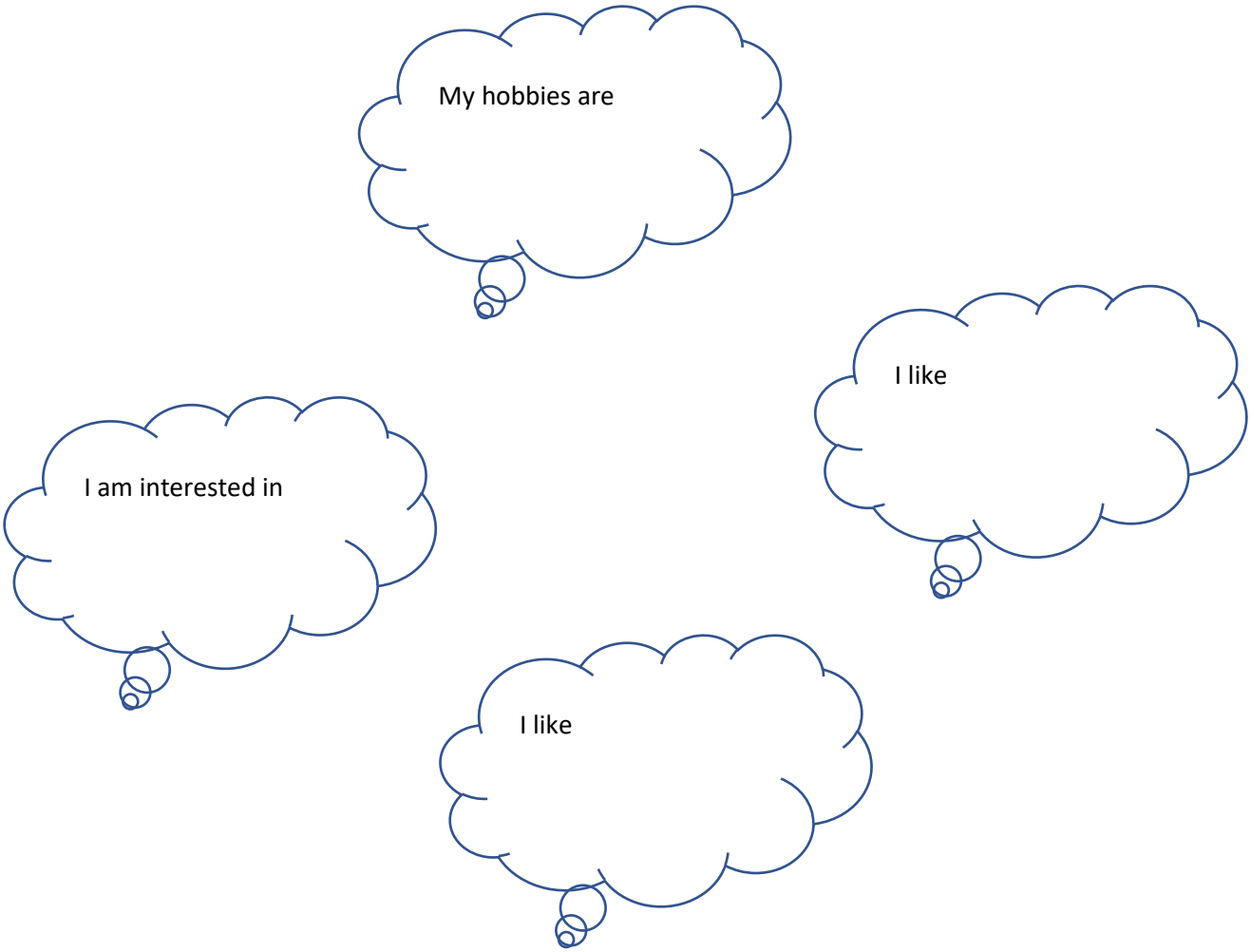
By the end of this session learners will

- talk about similarities and differences.
- identify similarities and differences that exist in their group and between each other.

Task 7.1

List 10 or more things about yourselves - about your likes, interests, hobbies, dreams, movies, play, places you would like to visit, etc.





You could write a few more statements about you or draw bubbles and fill them as above.

Homework 7.1

Repeat the activity of finding similarities with all your family members. Write the commonalities that everyone shares in your home. You could add pictures of your family members if you wish to.

Session 8: Interests and abilities

LEARNING OBJECTIVES

By the end of this session learners will

- become aware of their interests and abilities and talk about it.
- differentiate between interests and abilities.
- find out each other's interests and abilities.
- write a poem on their interests and abilities.

Task 8.1

List out five things for each of the following questions

a. What do I enjoy doing?
b. What do I like to do?
c. What am I good at?

Task 8.2

List 8-10 examples of your interests and 10 examples of your abilities here.

Task 8.3
Using the words write a 10-12-line poem about your interests and abilities.

Session 9: My dreams

LEARNING OBJECTIVES

By the end of this session learners will

- identify and think deeply about their dreams.
- express their dreams visually.

Task 9.1: Represent your dreams visually

Homework 9.1

Research on people or a person who is an inspiration to you. Their lives must be preferably similar to 'your' dream life so you can draw inspiration from their life. Think of reasons why you like them or admire them. Why do you aspire to be like them? Write this down as points and bring it to the next session.

Growth chart – 1

Filling this chart will help you understand your learning and progress

I Can…	My Growth Sticker		
	Seed (Image)	Plant (Image)	Tree (Image)
I can remember what I learnt in the sessions.			
I can explain what I have learnt in the sessions.			
I can use the information and understanding from the sessions in my everyday life.			
I can recognize the meaning of the sessions for my life and why we are doing it.			
I can examine my ideas, notions, perspectives on self, gender and the world around.			
I can create new ideas/artefacts and bring my point of view into it.			
I can share my point of view and understand others too in group work.			
I can work in teams and contribute actively.			
I can confidently use observation and data to answer any of my questions.			

Session 10: Facts or myths

LEARNING OBJECTIVES

By the end of this session learners will

- differentiate observations, facts and opinions.
- identify opinions, myths and stereotypes.

Task 10.1

Classify the following statements as facts/ observations, opinions and rules/ rights

- I study in a government school.
- Boys like playing cricket.
- Our skin is the largest organ in our body.
- Girls are good at playing kho-kho.
- Girls and boys have the right to education.
- Learning and school is exciting.
- We need to be 18 to get a driving license.
- I like all my friends.
- Science is a very interesting subject.
- Women's hearts beat faster than men's hearts.
- Human beings have 206 bones.
- Women enjoy cooking.
- All of us are equal.
- I am studying in class 8.
- Men have short hair.

Homework 10.1

Write five statements which are your observations or facts (Try and write about yourselves).

For example- I am 154 cm tall.

Write five statements which are your feelings/ opinions about yourself/ your likes and abilities.

I like ice-cream/ Golgappa.

Write two rules/ laws that you follow

Task 10.2

Write two or three questions that you might have at this moment – it could be about yourself, some opinions or some things that you wonder about?

Homework 10. 2

Think of myths and stereotypes that exist in your culture or society. You can discuss with your parents to find out more. List four or five myths/ stereotypes that you have heard or that your parents share.

Session 11: Gender stereotypes

LEARNING OBJECTIVES

By the end of this session learners will

- examine their notions about gender.
- recognise gender stereotypes in their day to day life situations.

Task 11.1

Think of a hospital in your city. Now imagine a surgeon working in the hospital. Draw an image of the surgeon working at the hospital. Try to make it as realistic as possible by drawing the surgeon's clothes, equipment, medicines and books. Once you complete your drawing, write the name of the surgeon and hospital on top of the sheet.

Take 5 minutes to draw this. It need not be artistic and neat as it is only a representation of what you think.

Task 11.2

Below are given a list of qualities. Take one quality at a time -

1. If you think the quality is shown by a boy or a man, then write it in the column called Man/ Boy
2. If you think the quality is shown by a girl or a woman, then write it in the column called Girl/ Woman
3. If you think the qualities are shown by both a man and a woman write the quality under the column called 'Both'

 Strong	 Caring	 Brave	 Heroic
 Determined	 Kind	 Loving	 Dominating

 Beautiful	 Nice	 Jealous	 Stylish
 Polite	 Intelligence	 Risk Taking	 Good at Math

 Fights	 Leader	 Helpful	 Hardworking

List of Qualities	Girl	Boy	Both
Strong			
Caring			
Brave			
Heroic			
Jealous			
Stylish			
Polite			
Intelligent			
Risk Taking			
Good at Maths			
Fighter			
Leader			
Helpful			
Hardworking			
Determined			
Kind			
Loving			
Dominating			
Beautiful			

Are you done with the above activity? Great, good job!

--How many of the qualities were only girl/woman, how many were only boy/man, and how many were both?

--Count and write the number in the table given below.

Person	Number
Only boys	
Only girls	
Both	

Alternative Task

Gender roles at my home and in my family

STEP 1:

1. Think about the people in your family. How many people live at home?
2. Now, in the box given below are a list of activities or chores that are done at home.
3. Next to the activity, write the name of the person who is responsible for it or does it the greatest number of times.

Chore/Activity	**Person responsible**
1.Cooks for family	
2. Cleans utensils	
3. Goes to work	
4. Washes clothes	
5. Shops for groceries	
6. Sweeps the floor	
7. Changes bedsheets	
8. Attends parent–teacher meetings	
9. Looks after homework	
10. Drops off at school	
11. Picks up from school	
12. Fixes things	
13. Serves food to the family	
14. Takes care of someone when they are ill	
15. Packs tiffin	

Step 2:

1. Now count the number of chores each person is responsible for and write it down in the box given below.
2. You can add extra boxes if you need to.
3. Circle the person who does the most work in the house.

People in the family	**Number of Chores**

Let's think:

1. Does one person do more work in your house than the others? Who is this person? Write their name _____

2. Why does this person do the most amount of work? Here are some helpful ways to think about it. Tick the one which is closest to your thoughts or write your own answer.

a. Because they are expected to do it.

b. Because they are more skilled to do it.

c. Other _____

Homework 11.1

ARE OUR ROLES DEFINED BY GENDER?

We often see that males and females have different roles. This is often true about our households but could also be true about schools and our society at large. But is this due to how we have been taught to see gender or is it due to the way we are born?

In the statements below, mark the statement that you think is most correct

1. Girls cannot go out after 7:00 PM unsupervised because:

    a. They are told not to.
    b. They will lose their way.
    c. They cannot take care of themselves.

2. Women earn less money as compared to men because:

    a. They do not have the biological capability to earn more.
    b. They are not given enough opportunities to study and earn as well as men.
    c. They cannot manage money properly.

3. Girls cannot use computers as well as boys because:

    a. Girls do not have the biological capability to use computers.
    b. Technology is a masculine field.
    c. This statement is false.
    d. Boys and girls can both use computers.

4. Women do not make good managers because:

    a. Women get carried away too easily and cannot be good managers.
    b. Men are better at managing people than women.
    c. This is only a false perception. Men and women can both be good managers.

5. Fewer girls complete higher education as compared to boys because:

    a. Girls do not have the ability to complete higher education.
    b. Girls should not complete higher education.
    c. Boys' education is given more importance than girls' education.

Session 12: Men and women are equal

LEARNING OBJECTIVES

By the end of this session learners will

- understand that men and women deserve equal opportunities.

Task 12.1

Look at the chart. This chart explains the universal declaration of human rights



(note to the designer- chart need to be recreated)

Homework 12.1

Identify four or five gendered myths and stereotypes that you have heard or experienced in your everyday life and/or have come across in the media/ advertisements/ newspapers.

Session 13: Analysing gender stereotypes

LEARNING OBJECTIVES

By the end of this session learners will

- ask pertinent questions with respect to images/ data/ life experience and/ or a situation.
- formulate a question for inquiry.
- enquire into a myth or stereotype with respect to gender.
- follow the process/ steps of inquiry applying the STEM mindset.

Task 13.1

Write one or two research questions by looking at the image/ graph

Finalise and frame one research question clearly

Task 13. 2

Develop a data collection plan. It can be a table where you will record the data or write a set of questions for surveys/ interviews

You could use additional sheets for data collection and those sheets could be later attached to the workbook.

Task 13.3

Students should collate the data, total no. of hours etc. and if possible, calculate the percentage and share the data with the group

Homework 13.1

Reflect on one or two myths that you have been able to examine. Relook at the activities on self that you have done. Now, after this module on gender and gender stereotypes, reflect on the following:

-Have you been able to identify a gender stereotype/myth that you carried?

- Has this myth/ stereotype been challenged or examined?

- Has the idea changed?

- Have you identified any strength or ability through this exercise?

- Have you found any new interests?

Challenging the stereotypes- Stories of men and women

Stories that challenge the stereotype/ role models. These stories are examples of people who have challenged the stereotype and achieved by breaking the myths. These stories could give ideas for your presentation. You could look for similar stories in the newspaper or talk to people in your community and find out.

STORY 1

This is the story of Arunima Sinha. Read it in her own words.

'There's a small district 200 kilometres outside of Lucknow called Ambedkarnagar. That's where I am from. Everyone in my family enjoys sports and I was naturally athletic as a child.
I have been cycling since I can remember, loved playing football and was a national level volleyball player. One day, I had to go to Delhi to sort out some documents. I got on to the general compartment of the Padmavat Express.
There was a huge crowd and I somehow threw myself in. Suddenly some four or five robbers gathered around me and started pulling at the gold chain on my neck. They thought that because I was a girl, I would not fight back. But I did. I kicked and punched and fought hard.
No one came to help me. Suddenly, each of the 4 men took each one of my arms and legs and threw me out of the train. I fell down on the opposite tracks and before I knew it, a train ran over my leg.
It was the most horrible night of my life.
Cockroaches and birds ate my open flesh. Trains passed me but no one stopped to help me, even though I was screaming. At some point, I passed out with pain. In the morning, some boys found me on the tracks. They took me to the hospital. The doctor told me that my leg had to be cut off. Usually, when you undergo this operation, you are given a medicine called 'Anaesthesia' which numbs that area and you don't feel pain. But the doctor informed me that there was no anaesthesia. I decided to go ahead with the operation so while I was fully conscious, the doctor used a saw to cut out my leg. I could feel every bit of the saw cutting into my skin and bones.
I was very depressed after this incident. But one day, lying in bed, I decided to do something - I decided to climb Mt.Everest. Everyone laughed at my plans, including the doctors. They said I cannot do it and no one has done it. I was determined to prove them wrong. I decided to go and meet Bachendri Pal, the first woman to climb Mt. Everest. She agreed to train me. She warned me that it would be tough and I have to really work very hard to achieve this dream of mine. I trained for 18 months. And then I started the journey. Climbing Mt. Everest is very hard. The road is windy and there is ice all around. I had a wooden leg and everyone still kept telling me I would not be successful. As I climbed, I saw the body of a person I knew and trained with. I was filled with fear but continued ahead. On 21st May 20t I reached the Everest summit. Today I run a school to help handicapped children learn sports. I try my best to help them as much as I can. I was awarded a Padma Shri, one of the highest honours given by the government of India and I also wrote a book about conquering Mt. Everest.'

STORY 2

A teenager from Africa had a dream of bringing electricity and running water to his village. And he was not ready to wait for years for anyone to do this.

He became desperate to do something in 2002, following one of the worst droughts in his country that killed thousands of people and left his family on the brink of starvation.

Unable to attend school, he kept up his education by using a local library from time to time. Fascinated by science, his life changed one day when he picked up a torn textbook and saw a picture of a windmill. He was very interested when he got to know that, by using a windmill, one could make electricity and pump water. He decided to make one by himself. In all his free time, when he was not working on a maize farm, he would work on his new project. People in his community made fun of him and thought he was mad.

One day, he climbed up the windmill he had made and attached a car light bulb to the turbine of the windmill. As the blades began to spin in the breeze, the bulb lit up and the crowd was shocked!
This boy came to be known as 'the electric wind boy' in his village. As he became famous, he was invited to a conference where he was introduced to the Internet. 'I had never seen the Internet, it was amazing,' he says. 'I Googled about windmills and found so much information.' Now he has his own website which talks about his work. By now, he has co-written a book called 'The Boy Who Harnessed the Wind'. There is also a movie being made on him!

STORY 3

Return to the mainstream: The tortuous track

Radha Balakrishnan

In 1957, when I was thirteen, I had just entered Std. IX in a co-educational school in New Delhi. The Delhi Board required a student to branch off into either the sciences or the humanities at that early stage. The science group was sought after because of better job prospects. Owing to the shortage of lab space, entry was restricted to students with marks above a cut-off.

I was among them and chose the science group. The principal addressed our class and urged the girls who had opted for science to give up their seats in favour of boys with lower marks. The girls, he said, were depriving those boys of good jobs in the future — because the only jobs that the girls would ever take up after getting married would be in the 'ladle-office' (the kitchen). I don't remember my reaction to this sarcasm, but the principal was merely echoing the mindset of the times. He presumably felt that he was giving the girls good advice, with their future happiness in mind. But I had always enjoyed and done well in the science-related subjects I'd been taught till then and was quite sure I wanted to continue studying science.

This was my rather tremulous entry into science, with a probable future in the ladle office looming large. I did well in the Board Exam in 1960 and got admission to Physics Honours at Delhi University, a course reputed to be challenging and among the very best in India – very few women even applied for it. Well-meaning family friends whose sons had taken this course opined that, as a woman, I would feel extremely isolated and hence find the course even tougher. But as I had always found physics to be interesting and enjoyable, I joined the course and went on to

complete my MSc. in 1965. By this time, many of the girls among my classmates in school and college were married. My parents might have liked to see me similarly settled, but when I wanted to do my PhD in the US, they gave me unstinting support and encouragement. They were exceptionally broad-minded and liberal, and I am eternally grateful to them.

I worked for my PhD at Brandeis University, and in 1970 defended my thesis (one of the very earliest studies of quantum crystals) on the effects of helium four impurities in solid helium three. My adviser, Prof Robert Lange, gave me constant encouragement and full freedom to try out my ideas and also offered to arrange for a postdoctoral fellowship in the US. When I told him of my decision to return to India, his prescient words were: 'As a woman physicist, you will need to produce twice as much work as a man to get half the recognition. The prejudice and chauvinism of many men (no matter where they are from) towards women physicists is appalling.' I shall not describe the struggles during the decade that followed in trying to stay active in theoretical physics by publishing papers from home, while coping with raising children and the formidable difficulties encountered in finding employment commensurate with one's qualifications, without breaking up the family.

Let me 'fast forward' to the 1980s. I am sincerely grateful to Prof. P. M. Mathews, for enabling me to work at the Department of Theoretical Physics, University of Madras, from early 1982 to early 1987 as a Research Associate (CSIR and UGC), and to Prof. E. C. G. Sudarshan, (then) Director, IMSc, for his support which led to my permanent position there in early 1987.

Around 1980, I had started studying nonlinear phenomena and solutions, and this became my major research interest in the succeeding years. At IMSc, I worked on the applications of solutions and the inverse scattering method to classical and quantum magnetic chains, superfluid helium, geometric phases associated with moving curves, etc. I got Fulbright grants for visits to Los Alamos National Lab, became a Senior Associate at ICTP, Trieste, and held CNRS visiting professorships in France. I have had the opportunity to collaborate with physicists from China, England, France, Poland, and the USA, in addition to colleagues, students and postdocs in India. From the 1990s, I have been studying the deep connections between nonlinearity and the differential geometry of curves and surfaces. I received the Tamil Nadu Scientists Award in the Physical Sciences (1999) for this work, and INSA's Professor Darshan Ranganathan Memorial Lecture Award (2005) for original and pioneering contributions in nonlinear dynamics.

In spite of setbacks and grave disappointments, my life as a researcher in physics has been extremely enjoyable. After my formal retirement in 2004, I am actively continuing my research at IMSc as a CSIR Emeritus Scientist. Over the years, things have changed considerably, and for the better. The RA schemes of the CSIR, UGC, etc. serve a vital purpose. The title of this article has been inspired by a recently-introduced scheme of the DST, offering fellowships to women scientists with a career break who desire to return to mainstream science.

To all those talented young women who love physics but are hesitating to take it up, I have this to say. People like you are needed to bring in new ideas to solve the many fascinating and challenging problems in diverse areas of physics today. Motivation is as important as innate intelligence to succeed in creative research. When the going gets tough (as it surely will), hold your head high, work hard, and do not give up! Take inspiration from the heroic lives of Sophie Germain, Ada Lovelace, Sonya Kovalevskaya, Marie Curie, Lise Meitner, Emmy Noether, Cecilia Payne-Gaposchkin and Maria Goeppert-Meyer.

The joy that one derives out of original research, however small one's contribution may be, cannot be explained in words. It has to be experienced.

(Source- Lilavati's daughters)

STORY 4

Science is fun every single day

Sudha Bhattacharya

Migrating from a small town in Punjab, after India's partition in 1947, my mother landed in New Delhi as a young bride. Months of bloody turmoil followed, during which the future appeared grim and uncertain. But after the dust and hatred had settled, my mother began to slowly realize the great potential independent India seemed to offer in the field of education. For one thing, she observed these 'Madrasis and Bengalis' around her who were so highly educated-yet led such 'simple' lives and she secretly resolved that her children must get the best education. So what if that needed money, which was hard to come by? And so it was that my father found himself willingly spending a substantial part of his salary on sending his children to top-of-the-rung 'English-medium' schools rather than the free-of-cost neighbourhood school.

In high school, science and maths came naturally to me, and I easily scored high grades. I was a very dreamy girl (still am!). I was not driven by ambition and drifted merrily along. Since I was scoring well (even better than many of the 'Madrasi and Bengali' girls in my class), my mother was satisfied. However, I had no personal goals – no thoughts for my future. My mother, on the other hand, did have a goal for me. She thought I should do my BSc, BEd, take up a teaching job and get married. I can't blame her. In a family where most of the boys, not to mention girls, didn't enter college, that was ambition enough. In any case, she had never heard of a PhD.

Whether it was the way science was taught in school, or my own dreaminess, or my mother's emphasis on scoring high marks, I more or less looked at science as a subject to score highly in, rather than as a source of wonderment or of creative joy. It was only in class eleven when we were introduced to genetics, and the DNA double helix, that I felt myself participating in the thrill of scientific discovery, of not merely accepting the formulae laid down in the textbook, but of stopping to wonder and question. However, I still never imagined myself becoming a practising scientist.

My first realization of how timid I was in my approach to life came when we attended our first National Science Talent summer school, where we met the contingent from Mumbai. These students had much better exposure than the Delhi group; they had met internationally renowned scientists visiting Mumbai for lecture tours; they knew about the thrilling discoveries in molecular biology, and it occurred to me that it was within my grasp to explore more challenging avenues than school teaching. At the same time, I realized the blunder I had committed to selecting botany as my subject of study in BSc (Hons). Since my heart was, by then, firmly set on molecular biology I found it impossible to reduce the beautiful and myriad differentiation processes in plants to mere 'life cycles' to be mugged up.

Relief arrived in the final year of BSc, when we got an excellent and charismatic professor to teach us plant physiology. You could sense electrons getting energized by photons of light

impinging upon chlorophyll. It was participatory teaching where, aside from being informed of the established facts, we were also made aware of the grey areas that required further research to get illuminated.

As far as I was concerned, school teaching was definitely fading into the distance. A new ambition to do research in molecular biology was taking root, without my consciously realizing it. But that meant getting admission into MSc biochemistry. In the whole of New Delhi only two institutes offered that course - The All India Institute of Medical Sciences, and Indian Agricultural Research Institute, and both admitted only one or two students each year in this subject. As luck would have it, that year, 1971, AIIMS decided not to admit any student to this course. So that left only IARI, which had two seats.

My mother refused to let me try for admission to institutes outside Delhi because she was preparing to look for a groom for me. She was already upset with me for vetoing her idea of opting for BEd. Nor wishing to rock the boat further, I decided to prepare really hard for the IARI interview, and as is usually the case, when you really want something you get it. Getting admission into the MSc Biochemistry course at IARI was the final turning point. Excellent teachers instructed us in state-of-the-art molecular biology, molecular genetics and enzymology.

Meanwhile, pressure was building at home to initiate the process of arranged marriage - for which one had to get photographed in a suitably attractive pose. That was the first time my mother heard of my plans to do a PhD. A storm literally broke loose. The same mother who years ago had resolved to give her children the best education now declared that enough was enough! My father could understand my desire for a career, but he was branded as most impractical in these matters. Actively arguing with my mother was not an option. Knowing how much she had sacrificed in the prime of her life to give me the education I could easily have missed, I had no right to break her heart. At the same time, growing up at the peak of the feminist movement, I was almost obliged to withstand such pressures. The only path left to me was passive resistance – an otherwise arduous route, but one that becomes easy when you develop the confidence that arises from understanding your innate strength.

So, with a bit of 'Gandhigiri,' I managed to stall my mother's attack and completed my PhD. Meanwhile, I slowly tried to convince her that a woman's place in the world was not the same as before, and that marriage was not the ultimate goal of life, with the result that when I, still unmarried, set sail for the US with a postdoctoral fellowship, she was no longer worried about my future. In fact, two years later she herself stepped out of the house to work for a voluntary organization that had set up schools for slum children.

In retrospect, my mother did me a favour by offering resistance. It toughened me and prepared me for further challenges. The most difficult challenge was when I myself became a mother. In whose care could I leave my lovely little daughter and go off to the lab? The absolute and unconditional support of my husband, himself a scientist, and also a collaborator by that time, was a big help. Yet, he had his own immense pressures to bear. We had just moved to a new job, in a new city, and were new parents. We worked in shifts for almost a year until we could find a reliable daycare. However tough the going, our research had become such an integral part of our lives that one could hardly imagine life without it. That was my sustaining force.

Earlier on, during my PhD, I had realized how lucky I was to get into scientific research. The power, however infinitesimal, of hoping to comprehend how life processes work, was to me a soul-elevating experience. It was exciting that one could lead a whole life in such pursuits. One

could have fun every single day- if not with one's own research findings, then with new discoveries coming from other lands. Even the frustrations one experienced almost on a daily basis were part of the fun, because finally when a new experiment worked, it was the purest form of joy.

My personal take on scientific research, after having dabbled with it for that many years, is that if fame and wealth are what you expect from a career in science you are asking for too little. For when science is practised in its pristine form, it has the power to elevate you to a finer level of existence – one where Truth is absolute and the narrow limits of human perception are duly acknowledged.

So, to the young women choosing a career in science, I would say (borrowing from a popular ad) - When it comes to Science, be demanding...because you are worth it!

(Source- Lilavati's daughters)

Session 14: Safe and unsafe touch

LEARNING OBJECTIVES

By the end of this session learners will

- recognise safe and unsafe touch.

Homework 14.1

Choose your body outline and note how you felt when you were touched by using colours and symbols.

You could use the colours
Green, when it is allowed to touch;
Red, when it is not allowed to touch; AND
Black, for taboo zones or private parts

You could use the following symbols (these are some suggestions- you could use any symbol)

Known female-



Unknown female-



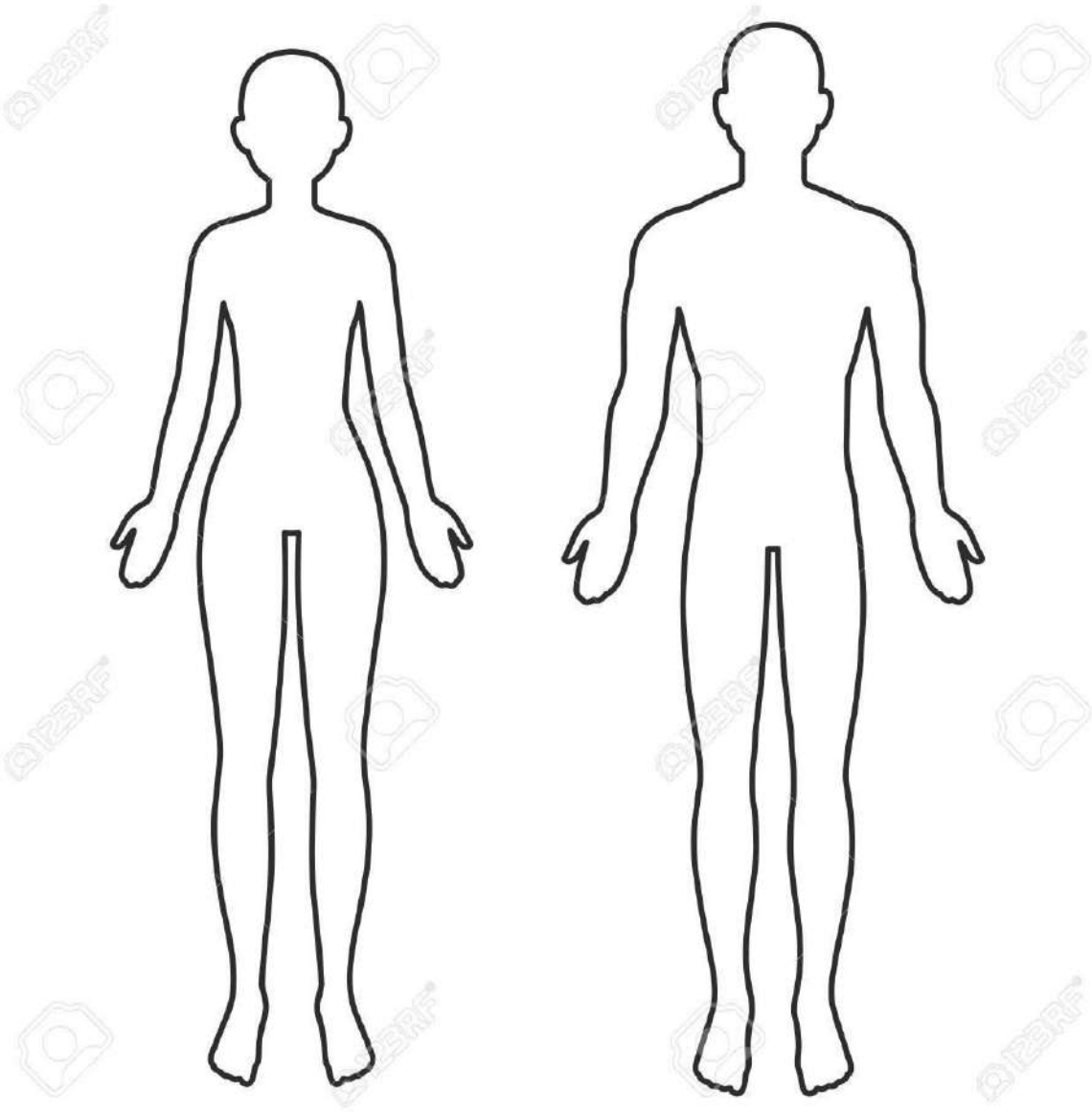
Known male-



Unknown male



This worksheet will help you think about your feelings and how you felt when you were touched. This is more personal. Once you complete this, you could use a stapler and pin it.



- ***Note for the designer- The outline to be redrawn***

Growth chart – 2

Filling this chart will help you understand your learning and progress

I Can…	My Growth Sticker		
	Seed (Image)	Plant (Image)	Tree (Image)
I can remember what I learnt in the sessions.			
I can explain what I have learnt in the sessions.			
I can use the information and understanding from the sessions in my everyday life.			
I can recognize the meaning of the sessions for my life and why we are doing it.			
I can examine my ideas, notions, perspectives on self, gender and the world around.			
I can create new ideas/artefacts and bring my point of view into it.			
I can share my point of view and understand others too in group work.			
I can work in teams and contribute actively.			
I can confidently use observation and data to answer any of my questions.			

Session 15: Let's learn computers!

LEARNING OBJECTIVES

By the end of this session learners will

- define a computer and its parts.
- list the uses of computers.
- understand input and output devices.

Do you know what a computer is?

A computer is an electronic device or a machine which works based on user instruction. A computer is an electronic device that can store and process information. Computers are useful in:

- sending and receiving messages.
- making presentations, videos.
- maintaining records.
- education and research.

Parts of a computer

We have different organs in our body like our hands, legs, eyes, etc. to perform different activities. Even for computers, there are different parts to perform activities.

a) CPU (Central Processing Unit)
The CPU (Central Processing Unit) is the most important part of a computer. It controls all the other parts, such as the Monitor, Keyboard and Mouse. These parts have to be connected to the CPU, for them to work.



Source- Wikipedia

b) Monitor

A monitor looks like a television screen. The CPU uses the monitor to show us photos, movies, games, and other activities. The mouse pointer (picture needed) can be seen on the monitor. Often, whatever we type using the keyboard, can be seen on the monitor.

c) Keyboard



Source- Pixabay

A keyboard is used to write/type on the computer. We can also use a keyboard to give instructions to the computer. The buttons on the keyboard are called 'keys'.

d) Mouse
(picture of mouse with left and right key)



Source- Pixabay

A mouse is used to select an item shown on the monitor. The mouse usually has two buttons and a small wheel between the buttons. To select an item, we first point to the item and then click the left button. To start an activity, we double click the left button. To control an activity, we click the right button. To move up and down a page, we use the wheel or scroll button.

Task 15.1 – Uses of a computer

Following are pictures of a few people doing some activities. Tick mark those activities that can be done by computers (pictures of)

a) a boy drawing a picture
b) a girl reading and writing.
c) a father cooking

d) a woman booking a train/bus ticket
e) a boy using a calculator
f) a woman eating
g) a girl making a card

(note for the designer to create the images)

Input and output devices

Have you heard the terms, input devices and output devices?

- Input devices allow us to send information to the computer. Input to the computer is usually given by clicking the mouse, typing on the keyboard, taking pictures and videos through a webcam, and recording voices through a microphone. So, these are input devices.
  (pictures of mouse, keyboard, webcam and microphone)
- Output devices allow us to receive information from the computer. Output from the computer may be printouts from the printer, sounds on the speaker, or images on the monitor. So, these are called output devices.
  (pictures of monitor, speaker and printer)

Homework 15.1

State whether the below statements are true or false.

a) The CPU is the most important part of a computer.
   True / False
b) The keyboard looks like a television.
   True / False
c) The mouse helps us to point at items.
   True / False
d) The keyboard works like a pencil of the computer.
   True / False
e) You can listen to a song on the computer through the speakers.
   True / False
f) The mouse can print what you see on the monitor.
   True / False
g) Your eyes are input devices of your body.
   True / False
h) The computer uses an output device to show us something.
   True / False
i) We use input devices to tell the computer what to do.
   True / False

Session 16: Search engines

LEARNING OBJECTIVES

By the end of this session learners will

- understand search engines.
- identify search techniques and strategies.
- explore the features and operations.

Have you heard the terms internet, website and so on? Let's find out more.

The Internet: a global system of interconnected computer networks or computers around the world that are connected to one another
The (World Wide) Web: the set of documents residing on the internet that are formatted in hypertext
Browser: a program used to view HTML documents, or the World Wide Web (e.g., Firefox, Safari, Chrome)
Website: a collection of web pages, a collection of links between pages, programs that do services (such as lookup things)
Web Address: The address of a web page on the world wide web. Also called a URL
Search Engine**:** a computer program that retrieves documents or files or data from a database or from a computer network. Its function is to scan the Internet, gathering information about millions of websites.

Task 16.1

Search online

SELECT - your research topic

Generate a list of occupations that are a good fit based on your interests so far. Next, narrow down to three occupations that really appeal to you.

EXTRACT - information

What are some strategies you will use to search for the information online? List down some keywords for the occupations that you are interested in.

Session 17: Algorithms

LEARNING OBJECTIVES

By the end of this session learners will

- recognise step by step planning of any activity.
- identify the main and detailed sequence of steps of any activity.
- follow stepwise instructions for any activity.
- articulate their understanding of algorithms and apply it in context.

Task 17.1

Write down step by step how you brush your teeth

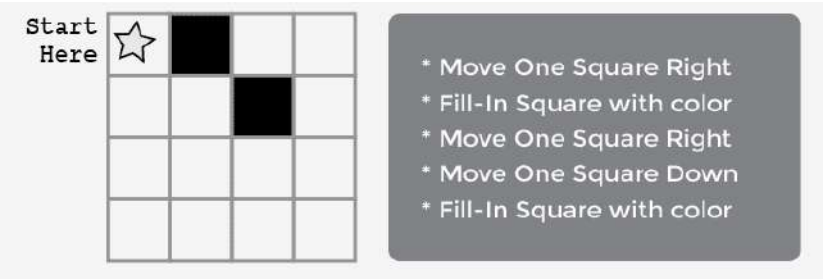
- STEP 1: _____
- STEP 2: _____
- STEP 3: _____
- STEP 4: _____
- STEP 5: _____
- STEP 6: _____

Task 17.2

In this activity, we are going to guide each other toward making drawings. For this exercise, we will use sheets of 4x4 graph paper. Starting at the upper left-hand corner, we'll guide our teammates with simple instructions. Those instructions include:

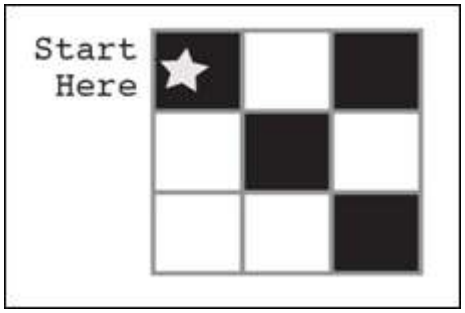
- Move One Square Right
- Move One Square Left
- Move One Square Up
- Move One Square Down
- Fill-In Square with colour

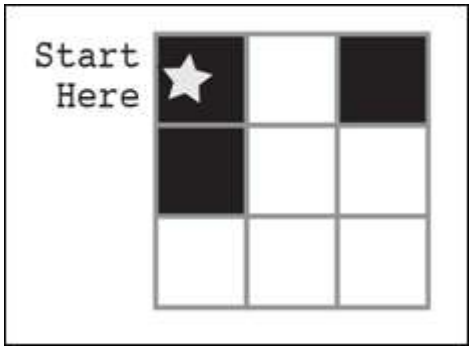
For example, here's how we would write an algorithm to instruct a friend (who is pretending to be a drawing machine) to colour their blank grid so that it looks like the image.



Write the algorithm and program on the right side. Instead of having to write out an entire phrase for each instruction, we can use arrows.







Task 17.3: Four-by-Fours Activity

With a partner choose an image from the ones given and convert steps into a program using symbols. Trade programs with another pair and draw one another's image.

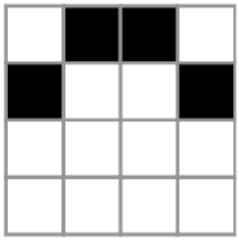


Image 1

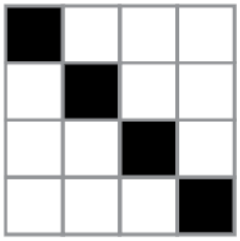


Image 2

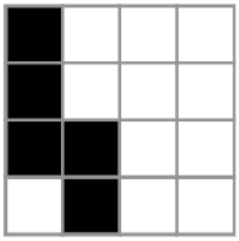


Image 3

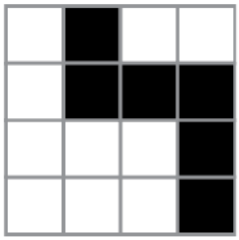


Image 4

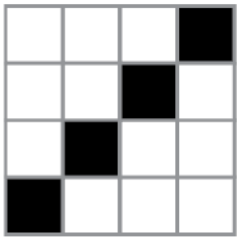


Image 5

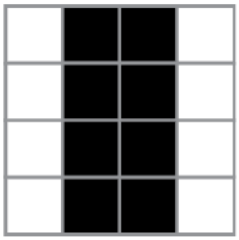
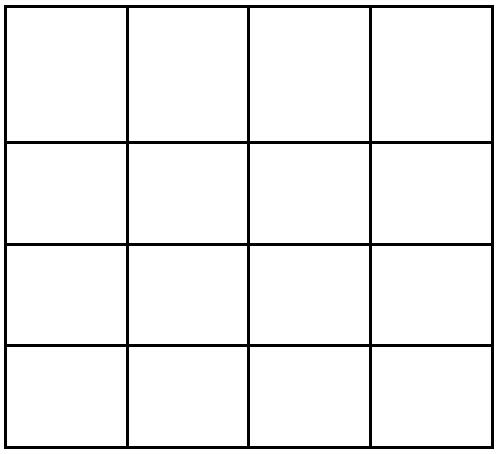


Image 6

Image No. _____

Steps:

A solution to your partner's program:



Session 18: Emoji

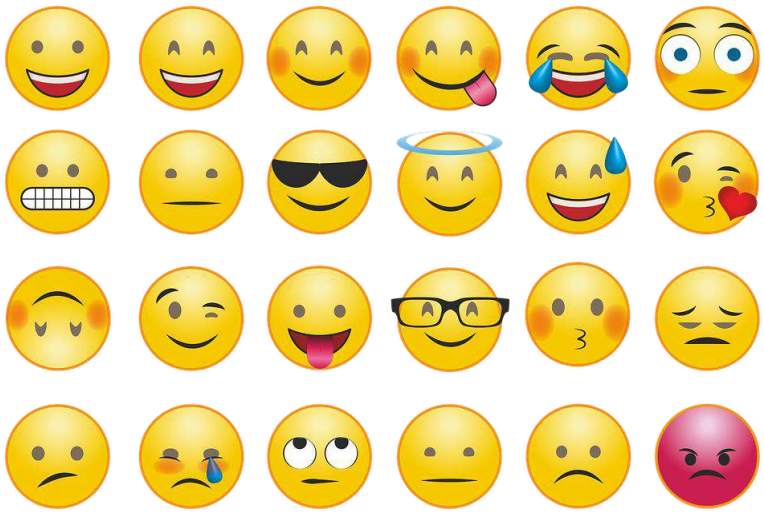
LEARNING OBJECTIVES

By the end of this session learners will

- give clear and specific instructions.
- express using symbol, signs and emojis.
- identify and express their emotions using symbols.

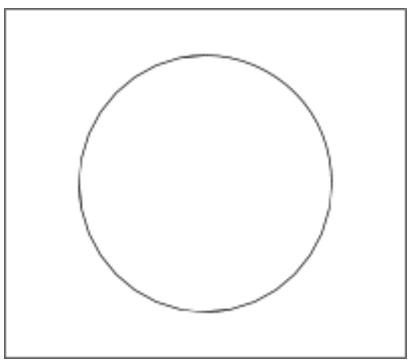
Task 18.1

Name the feeling behind each of these emojis and explain to your partner.

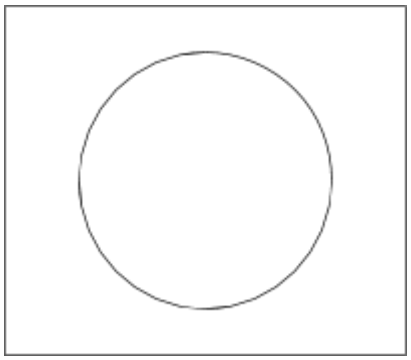


Task 18.2

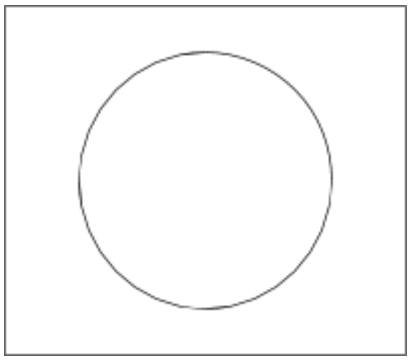
Select 4: Select two positive and two negative emotion emojis from each of the above sets that you like. Now draw the emojis in your own style and write two sentences under the face using the following



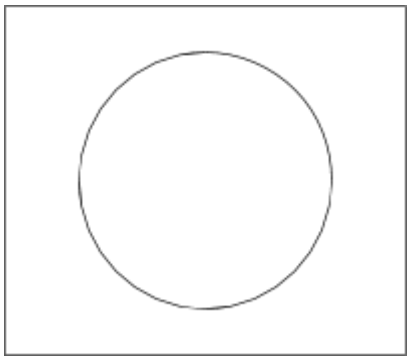
1. I feel _____(emotion) when _____(situation). When I feel this way, I _____(action)



1. I feel _____(emotion) when _____(situation). When I feel this way, I _____(action)



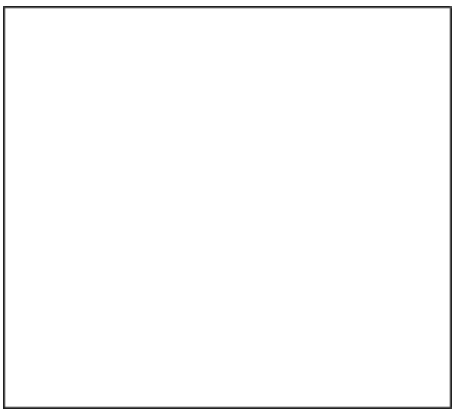
1. I feel _____(emotion) when _____(situation). When I feel this way, I _____(action)



1. I feel _____(emotion) when _____(situation). When I feel this way, I _____(action)

Task 18.3 Draw Like a Robot

Draw an emoji in 30 seconds

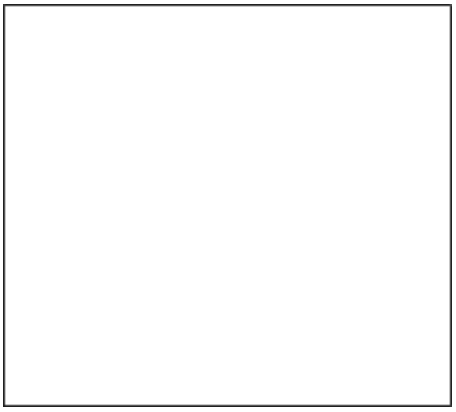


Write down the step by step instructions for a robot to draw their emoji in a very clear and precise manner.

Step 1: _____
Step 2: _____
Step 3: _____
Step 4: _____
Step 5: _____
Step 6: _____

Find a new partner and give instructions to the partner while she/he tries to draw it. Make sure partners cannot see your original emoji during this time period.

Emoji for when you draw like a Robot:



Reflection:

What was hard to get across to your partner?

_____
_____
_____

What worked well?

_____
_____
_____

How is this like talking to a robot?

_____
_____
_____

Task 18. 4: Emoji exit ticket

How do you feel about your day so far? Circle the emoji(s) and briefly explain why.



I chose this Emoji because - _____

Session 19: Imagine the change you would like to see

LEARNING OBJECTIVES

By the end of this session learners will

- get the opportunity to apply learning to real-world issues.
- identify a challenge or problem in their surroundings.
- have an understanding of multiple perspectives about an issue.

Task 19.1 And Yes...

What was it like to trust your partner's idea?

_____
_____
_____

How do you think we can use the idea of 'Yes, And' when we are brainstorming the best way to solve problems in our community?

_____
_____
_____

Task 19.2 Change you want to see

Write down 3 changes you would like to see that you think would really benefit your community

1. _____
   _____
   _____
2. _____
   _____
   _____
3. _____
   _____
   _____

Session 20: Project planning

LEARNING OBJECTIVES

By the end of this session learners will

- create possible solutions to the identified issue/problem.
- organize information and design a project plan.
- own given tasks and responsibilities and stay persistent with the effort.
- brainstorm possible solutions.

Task 20.1 The 5 Ws and H

In your groups discuss each of the following questions in detail and note down their responses clearly.

What? - What is the possible solution to the issue that your group wants to work on?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Why? - The reason for the selection of the particular topic

_____
_____
_____

Who? - Who can help you as mentors/guides to make your project more promising?

_____
_____
_____

Where? - Where will you demonstrate your work?

_____

When? - When is the final presentation?

_____

How? - How do you imagine you would present your idea in the best possible way?

_____
_____
_____

Task 20.2 Project Planning Sheet:

Team Members Names:			
Objectives			
What?			
Where?			
When?			
Why?			
How?			
Task Break-up			
Tasks	**Lead**	**Start Date**	**Finish Date**
Resources			
Materials:			
Information:			
Resources:			

Task 20.3 Project Planning

Why is it important to plan activities in detail?

_____
_____
_____

What are the roles and responsibilities you would like to take on for the preparation of the final project?

_____
_____
_____

Session 21: Project preparation and practising

LEARNING OBJECTIVES

By the end of this session learners will

- prepare for the project presentation.
- practice for the presentation.

Steps for preparation of a play:

Step 1: Brainstorm all possible solutions to the issue and make a draft script/narration of the play.
Step 2: Prepare a list of necessary props and assign roles.
Step 3: Start working on props and practice the play
Step 4: Practise the play with the help of the facilitator regularly.
Step 5: Check the props a few days prior to the performance of the play.
Step 6: Do a rehearsal in front of your class, receive feedback and practice for better performance.
Step 7: Perform the play on stage, before parents, teachers and friends.

Steps for preparation of a collage

Step 1: Brainstorm all possible solutions to the issue and make a list of information and ideas the group would like to present and assign roles
Step 2: Make a list of resources available for cut-outs - newspaper articles; magazines; quotes from teachers, community leaders, mentors; drawing material
Step 3: Collect the cut-outs and make a rough sketch of the collage
Step 4: Prepare a narrative to present the work
Step 6: Do a rehearsal in front of your class, receive feedback and practice for better performance.
Step 7: Perform the play on stage, before parents, teachers and friends.

Steps for verbal presentation

Step 1: Brainstorm all possible solutions to the issue and make a list of information and ideas the group would like to present and assign roles
Step 2: Make a draft speech and practice your presentation
Step 3: Do a rehearsal in front of your class, receive feedback and practice for better performance.
Step 4: Present on stage, before parents, teachers and friends.

Session 23: Final presentations

LEARNING OBJECTIVES

By the end of this session learners will

- present the project and share the solutions with the larger audience.

Checklist:

You are responsible for the event and what will happen. Discuss the plan with your class beforehand and make sure everyone is clear about the specific information given below:

- Location(s) and layout(s)
- List of the audience and chief guests
- Time of event and duration
- Decorations
- Program plan - the layout of the introduction of chief guest, project presentation, vote of thanks
- Invitations and/or advertising
- Documentation of the event - Photo/Video

Make a list of all the action points on the board along with clearly set deadlines and distribute the work evenly in the class.

Session 24: Learning to code

LEARNING OBJECTIVES

By the end of this session learners will:

- open, create and save projects.
- follow simple instructions to code and create projects.

Task 24.1

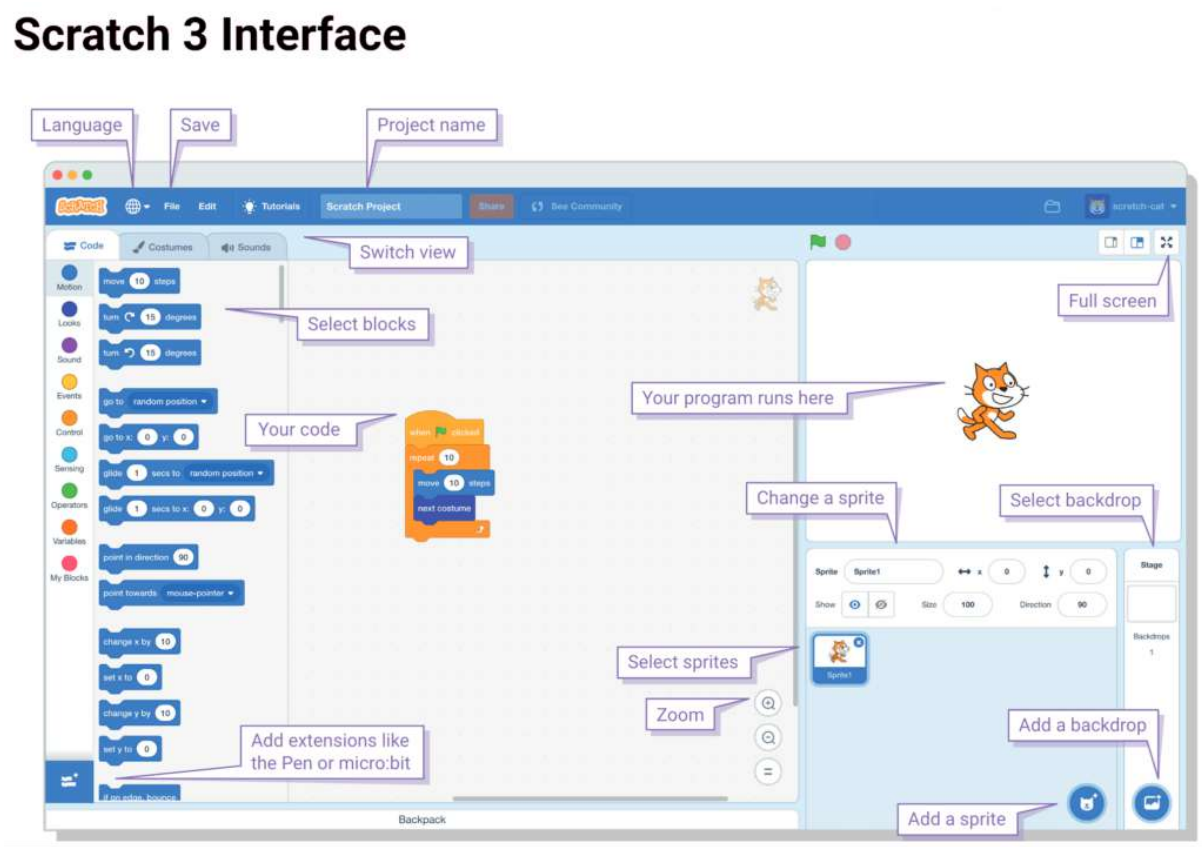
As you open Scratch and explore, colour the icons looking at the screen. This will help you revisit some of the icons.



For e.g. draw a flag and fill in green.

Fill the colours wherever you see this pencil mark.

Introduction to Scratch



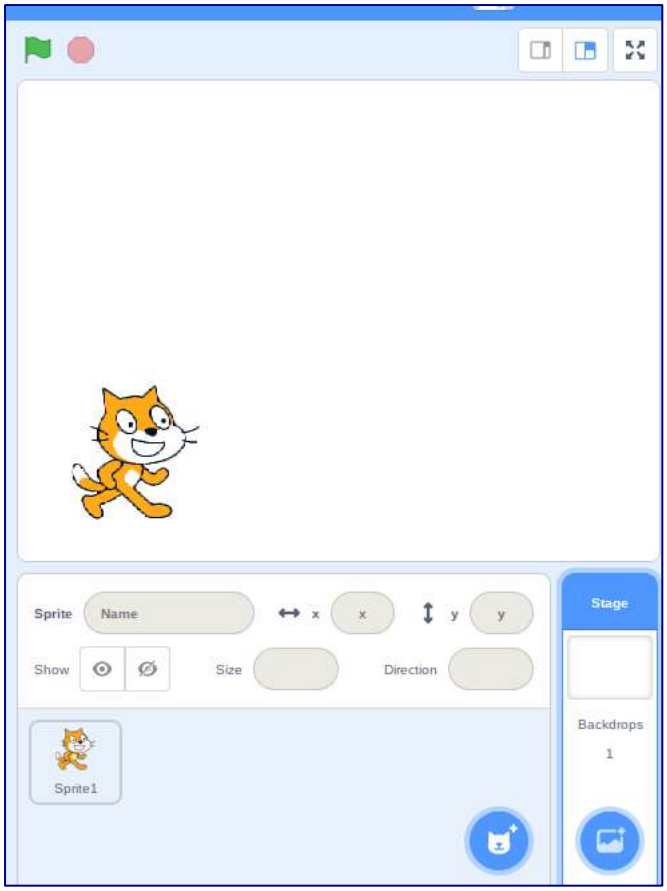
Steps for creating projects:

- How to start a new project
  - Click on File.
  - And then click on New.
- How to see the previous project
  - Click on File.
  - Then click on load from your computer.
  - A window will pop up.
  - Select the folder where you saved the project.
  - Select the project.
  - Click on Open.
- How to save a project
  - Click on File.
  - Click on Save to your computer.
  - A window will pop up.
  - Give a name to your project.
  - Select the folder you want to save.
  - Click the save button.

  (Remember to save the project once you start the project to reduce the chance of missing the project)

Stage

Just like a theatre's stage, the stage (see Scratch Interface image above) in the Scratch interface is where you see all of a program's activities/scripts happen. Programs are called projects in Scratch. A project (program) consists of one or multiple scripts, which you create by combining code blocks. When you run a project or activate a script, the result is displayed in the stage area. The dimensions of the stage are 480 pixels wide in the horizontal direction or X-axis, and 360 pixels high in the vertical direction, or Y-axis. When you want to indicate an exact position on the stage, you use a pair of X and Y values, or coordinates, similar to how you'd plot a point on a graph.



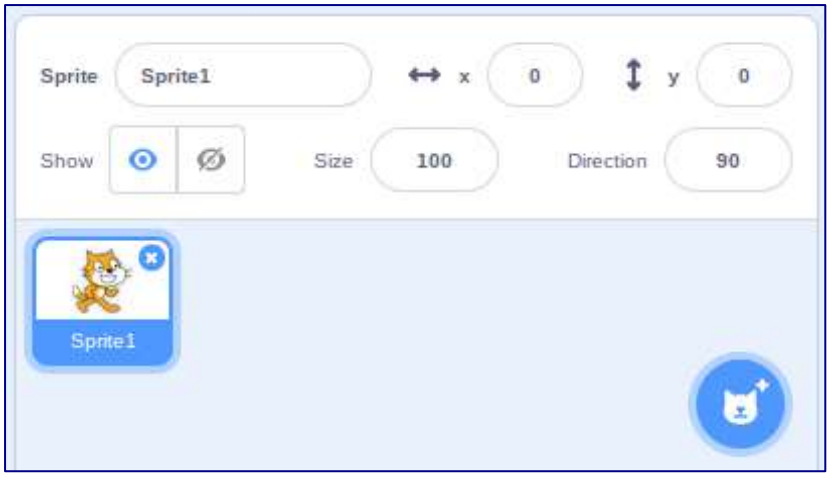
Scratch 3 stage area

The top of the stage provides some controls. Clicking the green flag in the upper-left corner of the stage area can activate (trigger) a script that includes a corresponding green flag code block. Clicking the red octagon in the upper-right corner of the stage area will stop all the scripts in a project from running.

Change the stage size with the 3 buttons in the top-right corner of the stage area. The stage can be 3 different sizes.

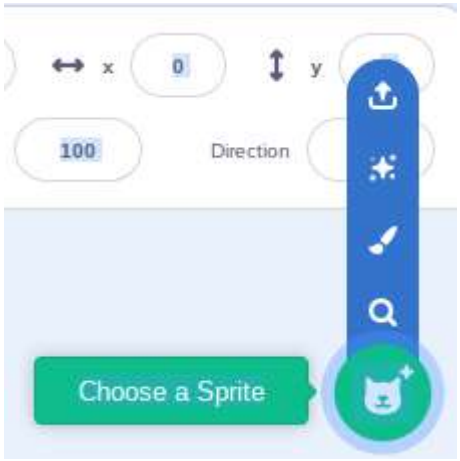
Sprites Pane

The Sprites pane (see image below of the Scratch 3 Sprites Pane) is where Scratch displays thumbnails of the sprites that are being used in the current project. Sprites are objects that perform actions in a project. These actions are determined by the scripts that you create. The scripts tell the sprites what to do and what actions to perform. The cat sprite called Sprite1 always appears by default when you create a new project.



Sprites Pane

To add a new sprite to a Scratch project, you use the icon in the bottom-right corner of the pane. Clicking this button allows you to choose from a library of already existing Sprites offered for free on the Scratch website. Moving the mouse over this initially reveals more options, like this:



Add Sprite options

Let us go through these quickly to see what they do:



Upload Sprite. The folder button (with upload arrow) allows you to upload a sprite from your computer.

> Tips: You can upload animated gifs to make your sprites animated. You can also find already created and free to use sprites for Scratch online.



Surprise. This randomly selects a sprite from Scratch's library and inserts it into your current project.



Paint. The paintbrush button creates a blank sprite with an empty costume.



Choose a sprite. A redundant button really. Same as the button that initially holds all of these buttons. (Scratch's head with a + in the top right-hand side.) Both of these buttons allow you to choose a sprite from the library.

Backdrops Pane

The Backdrops pane (see image below) is where Scratch displays a thumbnail of the current backdrop that is being used in your project. A backdrop is a background that appears behind your sprite in the stage, and every project has at least one. You can keep track of the backdrops used in a project with the Backdrops pane, which is to the right of the Sprites pane in Scratch 3. Backdrops are explained more thoroughly here.

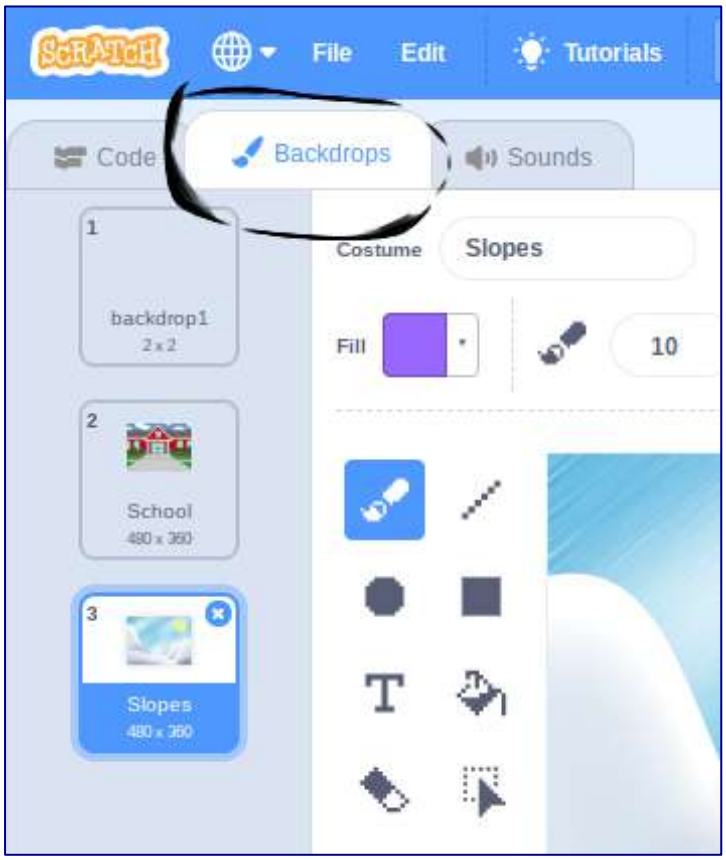


Backdrops Pane

The white backdrop always appears by default when you create a new project. The Backdrops Pane button has the same options as the Sprite Options button, except they are for the background image instead of the Sprite.

Backdrops Tab

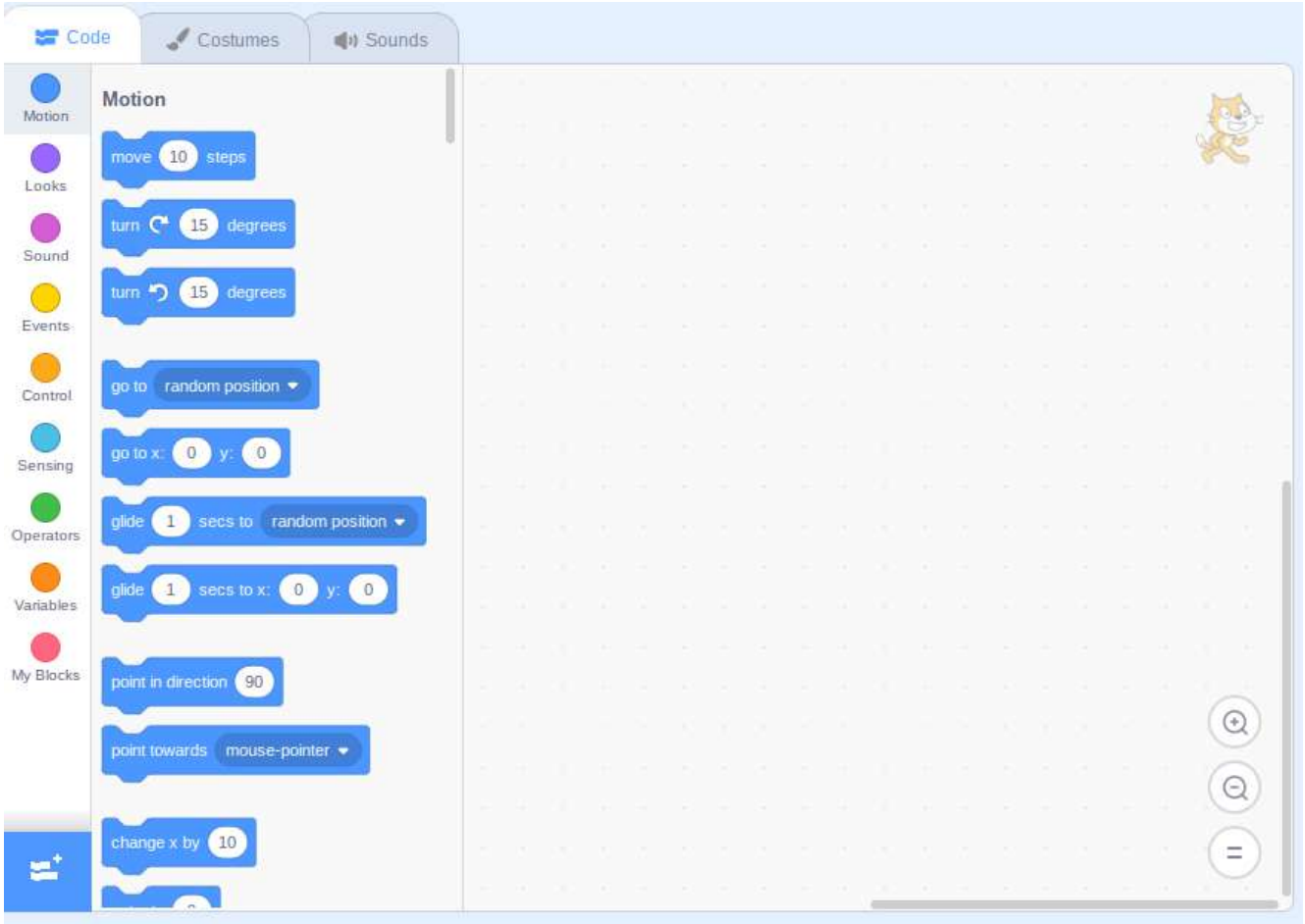
If you click the Backdrops tab, in the top left of the screen. (see image below) This tab shows all the backdrops that are being used in the project.



Backdrops Tab

Block Palette

The block palette (see image below) is where you find the different categories of code blocks. You drag and drop these code blocks to the scripts area (right) and snap them together to create scripts.



The block palette

The block palette contains ten categories of code blocks. Each category has its own colour, so whenever you see blue blocks, for instance, you know they deal with motion. These are the categories:

Motion blocks**:** These blocks control the movement of the sprite. You'll learn how to use motion blocks here.

Looks blocks**:** This category includes several blocks of code that can be used to modify the appearance of a sprite. With these blocks, you can apply graphic effects to the sprite, change the colour of the sprite, or change the size of the sprite. More about this category can be found here.

Sound blocks: These blocks add and control sound in your Scratch project. More about this category can be found here.

Event blocks**:** These blocks control when and how the scripts are activated. With these, you can control whether a script starts running when the user clicks the green flag or a sprite. You'll learn more about these blocks here.

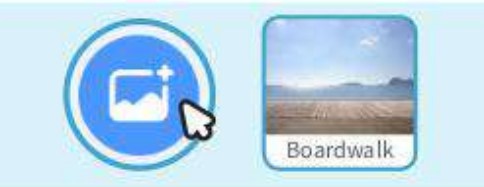
Control blocks: These blocks control how the scripts run. For example, you can pause the script for a specified amount of time or you can repeat a sequence of blocks a specified number of times. More about this category can be found here.

Operators blocks**:** These blocks perform math functions, such as adding, subtracting, and dividing numbers. You can also perform operations on strings of characters, such as comparing them and adding multiple sentences or words to create a new sentence. More about these blocks can be found here.

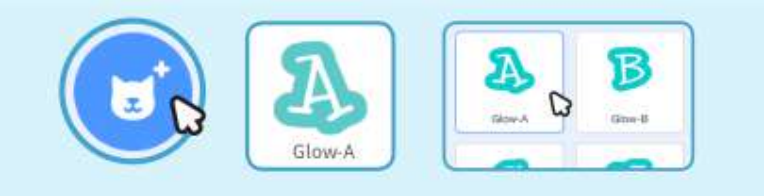
Task 24.2 Animate your name

Use the letters of your name in a fun way: make them jump, spin or change colour.

- In Scratch, click Create. Name your project and make sure you save it after every few steps.
- Choose a new backdrop:



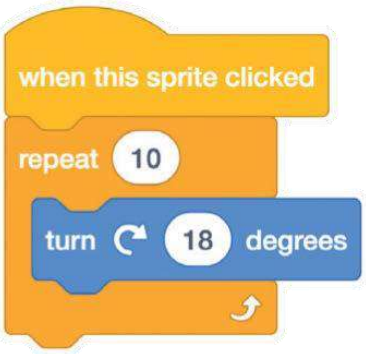
- Choose the first letter from the Sprite Library. To see just the letter sprites, click the Letters category at the top of the Sprite Library.



- Add effects. You can use the effect from any of the following ideas given below:
  A) Make a letter change colour when you click it:



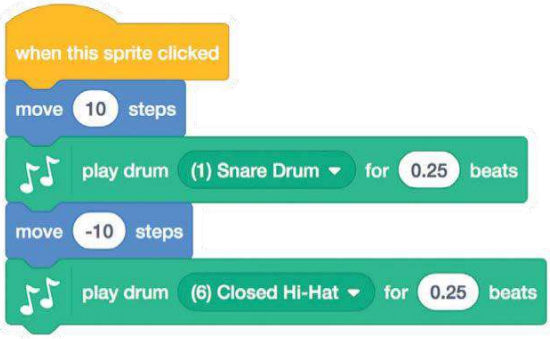
  B) Make a letter turn when you click it.



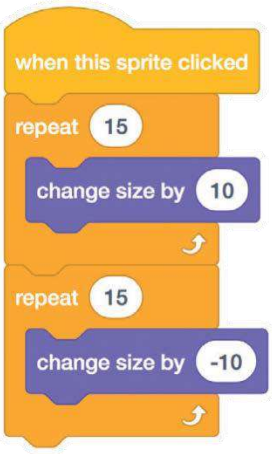
  C) Add a sound:



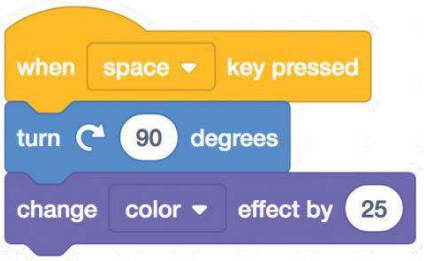
  D) Make a letter move to the beat:



E) Make a letter get bigger and then smaller:

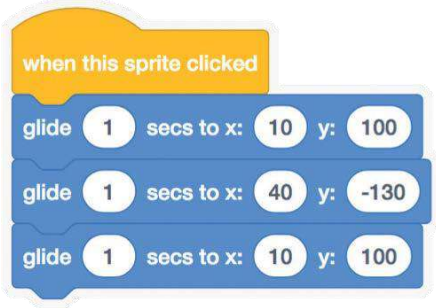


F) Press a key to make your letter change: You can choose a different key from the menu.



G) Make a letter glide smoothly from place to place: When you move a sprite, you can see the numbers for x and y update. Try different numbers.

x is the position from left to right.
y is the position up and down.



Add the rest of the letters and repeat the process.
Share your project with the rest of the class.

Reflection:

- What do you like best about the project you made?
  _____
  _____
- What was the hardest part?

_____
_____

- If you had more time, what would you add or change?

  _____
  _____

Session 25: Let's make a game

LEARNING OBJECTIVES

By the end of this session learners will:

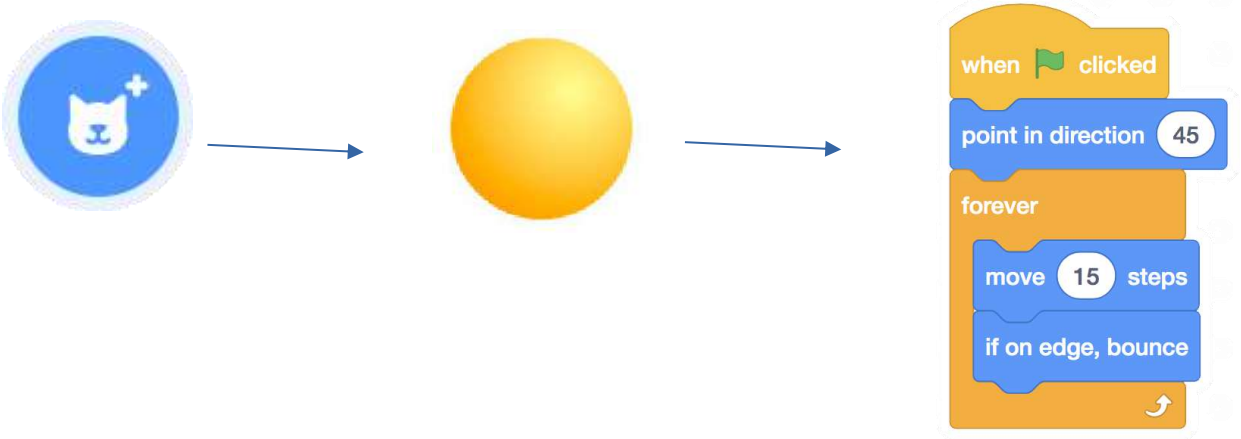
- explore the forever loop.
- gain experience with coding as they design a bouncing ball game.

Task 25.1 Design a bouncing ball game

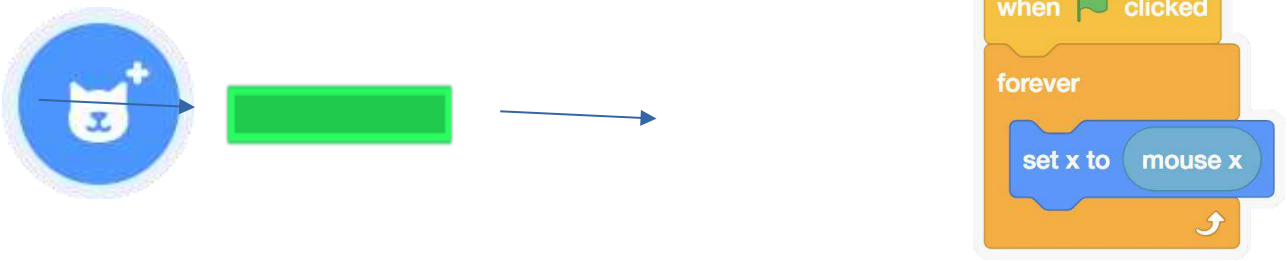
Open the Scratch website. Click Create. Choose a new backdrop.



Choose a ball sprite and make it bounce around. You can also draw a ball sprite.



Add a paddle sprite and control it with the mouse



More things to try:

- Add sounds and colour effects.
- Keep score by adding a variable.
- Add a way to win or lose the game.
- Change the backdrop when you reach a certain number of points.
- Duplicate the ball for an added challenge.

Share your project with the rest of the class.

Reflection:

- What did you notice about the games you tried?
  _____
  _____

- What do you like best about your game?
  _____
  _____

- If you had more time, what would you add or change?
  _____
  _____

Session 26: Creating a Scratch project

LEARNING OBJECTIVES

By the end of this session learners will:

- identify the elements of a story.
- use the storyboarding organiser and organise the story.
- create a story using Scratch.

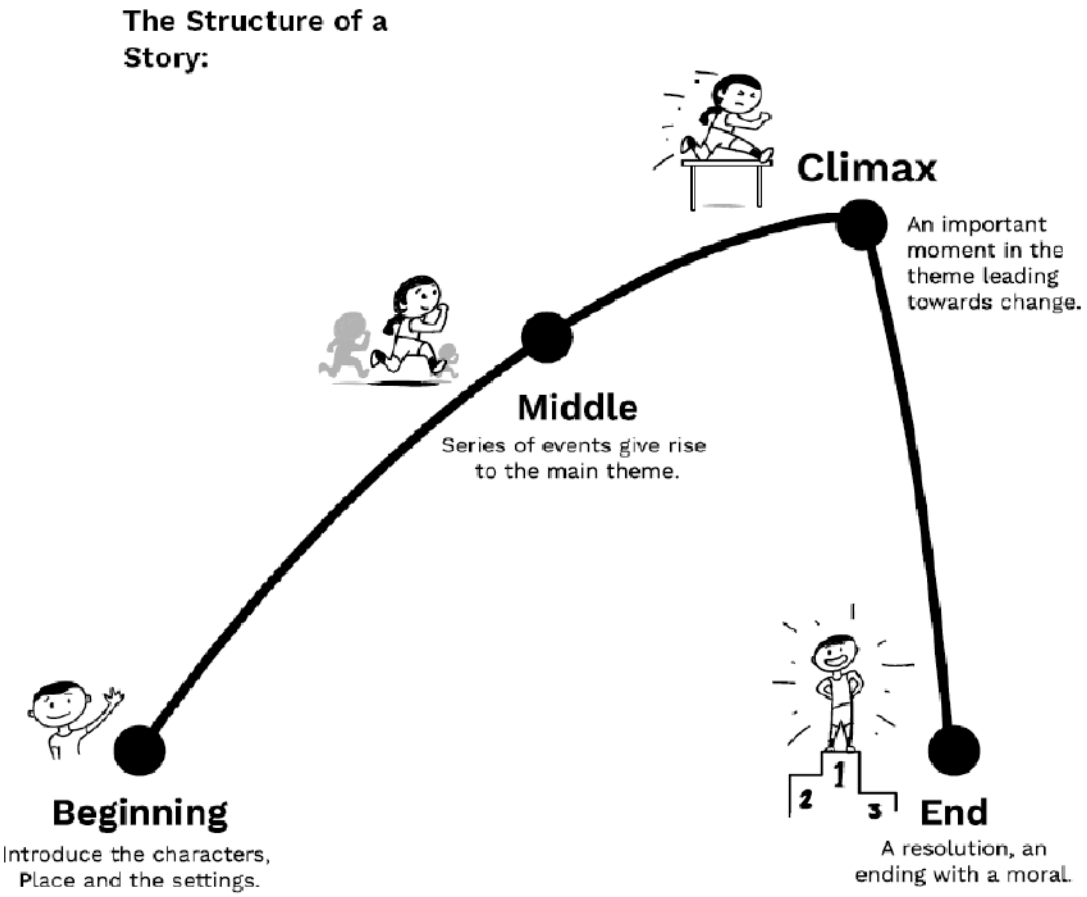
Task 26.1

Discuss in your group and select one topic which you want to show others by making a project using Scratch.

Have you made a decision?

Steps for Storyboarding

- Who are the characters in your story?
- What scenery or backdrop(s) will you want for your story? Where does it take place?
- How will your story start?
- How will the story end?
- What do you want the viewer to take away from your story? What message are you hoping to send?
- What are 1-3 major events that happen during the story?



(This could be presented as is or re-illustrated)

Sequence the script and write your script here

OR
Steps for presentation on a topic

- Research on women scientists/ politicians/ athletes/ or other topics you chose
- Collect four to five lines of biographical information

Decide the order of slides and write your script here.

When you create a script, make sure that there is a beginning, a middle part, a climax and an end.

Let's reflect:

What were the challenges faced while writing a script?
Where did you get stuck while making the project? How did you get unstuck?
Which part of the project are you most proud of?
What changes could you have made to improve your project?

Session 27: Let's learn to present

LEARNING OBJECTIVES

By the end of this session learners will:

- share their projects, and give and receive constructive critical feedback.
- understand the importance of good body language, eye contact, and speaking confidently.

Tips for good presentation skills

> Make eye contact.
Eye contact is crucial to holding the attention of your audience. Look at everyone in the audience from time to time. Try to involve everyone, not just those directly in front of you.

> Feel confident about your presentation
It is important not to be nervous before the presentation and have confidence in yourself that you will do well. This confidence can come only through prior preparation and study for the presentation.

> Good body language
Try to appear confident and enthusiastic. If you're standing up, you will need to hold your head up and have your arms open.

- Smile at the audience.
- Voice: You can use your voice to emphasize on certain parts of your presentation to make the presentation more interesting.

Session 28: Final presentations

LEARNING OBJECTIVES

By the end of this session learners will

- present their Scratch projects.

Checklist:
You are responsible for the event and what will happen. Discuss the plan with your class beforehand and make sure everyone is clear about specific information given below:

- Location(s) and layout(s)
- List of the audience and chief guests
- Time of event and duration
- Decorations
- Program plan - layout of introduction of chief guest, project presentation, vote of thanks
- Invitations and/or advertising
- Documentation of the event - Photo/Video

Make a list of all the action points on the board along with clear set deadlines and distribute the work evenly in the class.

Growth chart – 3

Filling this chart will help you understand your learning and progress

I Can…	My Growth Sticker		
	Seed (Image)	Plant (Image)	Tree (Image)
I can remember what I learnt in the sessions.			
I can explain what I have learnt in the sessions.			
I can use the information and understanding from the sessions in my everyday life.			
I can recognize the meaning of the sessions for my life and why we are doing it.			
I can examine my ideas, notions, perspectives on self, gender and the world around.			
I can create new ideas/artefacts and bring my point of view into it.			
I can share my point of view and understand others too in group work.			
I can work in teams and contribute actively.			
I can confidently use observation and data to answer any of my questions.			

Story time

Here are some stories for you to read and get inspired. These are stories of women and girls - scientists, doctors, mountaineers and so on. These stories are illustrated interestingly for you to read, enjoy and dream big.

(Stories for illustration)

Story- 1

'My reason for climbing Mt. Everest was to prove girls can achieve anything'- Poorna Malavath:

The first time Poorna Malavath saw Mount Everest, she turned to her coach and said cheerfully, 'It's not that tall. We can climb it in a day.' She was 13 years old.

Malavath had come to the Everest base camp from a government residential school in Telangana after eight months of gruelling mountaineering training. As part of her training, she had had to scale Mount Renock at 17,000 feet in the Kanchenjunga range in the Himalayas, which was then followed by acclimatisation in the mountains around Ladakh, at −35 degrees Celsius. On 25 May 2014, Malavath, along with her 17-year-old friend S Anand Kumar, summited Everest. She became the youngest girl in the world to have ever done this.

Malavath is now 20 and a movie was released based on her experience. It is titled *Poorna: Courage has no limits*. She often says in interviews and discussions that the only thing she has wanted her achievements to prove is that, 'Girls can achieve anything'. As Poorna Malavath says, 'People think girls can't do everything, but in my experience, they can. It was my reason for climbing Everest.'

Edited from

https://www.firstpost.com/living/poorna-malavath-my-reason-for-climbing-mt-everest-was-to-prove-girls-can-achieve-anything-3363538.html

Story 2 - First Indian woman athlete to participate in the Olympics- Nilima Ghose

Nilima Ghose made history at the age of 17 by participating in the Olympics. She was the first female athlete from India to participate in a Summer Olympics, in the year 1952. Though she did not qualify for the finals, she set a precedent and became an inspiration for aspiring athletes. She participated in the 100m race and 80m hurdles. She completed the 100m in 13.8 seconds.

The normative and conventional gender stereotypes had to be challenged in the 50s. The training of women in sports, sportswear, behavioural notions, notions of woman's body and beauty were hard to break during her times. There were other challenges such as lack of training, lack of encouragement, no role models, facilities and infrastructure for women to train and so on. The barriers were countless during those times.

'Courage, sacrifice, determination, commitment, toughness, heart, talent, guts. That's what little girls are made of; the heck with sugar and spice.' – Bethany Hamilton

Edited from https://feminisminindia.com/2020/05/01/nilima-ghose-olympics/

Story 3- 'The happiness one feels on solving a difficult problem is indescribable' -mathematician and scientist Rajinder Jeet Hans-Gill.

Often moving to small villages in Punjab, Hans-Gill had little opportunity to go to school. Her uncle very reluctantly agreed to let her stay with him and study at a school for boys, where she could only go posing as a boy. This was a secret between her family and the headmaster. Her uncle was totally against the education of women and it was only after many requests from Hans-Gill and her father that he decided upon this course. 'I enjoyed wearing a turban and going to school with my brother!' notes Hans-Gill. Her regular schooling started much later and she joined school in the eighth class.

In her own words- 'I found that in general, schools for boys were better equipped, and had better standards and facilities. This seemed very unfair! Unfortunately, science and mathematics were not taught at my school, and noticing my interest, my father decided to help me in these subjects. But I could not appear for the university examination in science after studying at home, because science had a practical component that required a laboratory. So, my ambition to become a doctor ended and the road to become a mathematician opened up, although I was not aware of it at that time. I liked mathematics because of its precision and because I was better at it than others'.

In her autobiographical account *Search for equality* she notes, 'From childhood I wondered why girls were not sent to school, why women did not have jobs, why they were discriminated against in all walks of life. I spent many long hours thinking about such topics and dreaming of a new world where equality prevailed. So, very early in my life, I had somehow formed the idea that to overcome such problems, one must study and get a job'.

'Most persons hold mathematics in awe. Meeting a woman mathematician shocks them and they start narrating how scared they were of maths in school. I used to feel very amused till I started noticing that even my children were developing a fear of mathematics! I have always enjoyed discussing mathematical problems.'

Edited from

https://www.ias.ac.in/public/Resources/Initiatives/Women_in_Science/Contributors/rjhansgill.pdf

Story 4 - Where geometry meets art - Diana Taimina

Taimina was born in Latvia and completed her PhD in Theoretical Computer Science from the University of Latvia. Latvia is rich in handicrafts, and growing up in Latvia, Taimina learnt to crochet as a schoolgirl. She had always visualised patterns and algorithms in knitting and crochet, however, she did not connect knitting with her mathematics until a workshop on hyperbolic space. Henderson, another professor, used paper to explain hyperbolic space as it was hard to visualise at that time and Taimina realised that she could make this out of crochet.

She spent her summer 'crocheting hyperbolic forms' by the swimming pool. People walked by and asked her what she was making. She replied 'Oh, I'm crocheting a hyperbolic plane.' She created hundreds of models and provided the important link that the male mathematicians were missing. Her creations became the standard model for explaining hyperbolic space.

Her gender and her hobby, often associated with women, helped and led to an outstanding work in science. Bellos, a writer, notes, 'the idea of crocheted hyperbolic planes would have never been conceived had Diana Taimina been born a man'. Women are underrepresented historically in the field of mathematics and Taimina's ability to bring mathematics and art together helped break many misconceptions on how mathematicians think and work.

Edited from : https://shethoughtit.ilcml.com/biography/daina-taimina/

Invisible women: Exposing data bias in a world designed for men- Caroline Criado Perez

Story 5- 'Keep your face to the sunshine and you cannot see the shadow'- Hellen Keller

Helen Keller, an American educator and advocate for the blind and deaf, was struck by an illness at the age of 2. This illness left Keller blind and deaf.

Keller was taught by her undeterred teacher Anne Sullivan.

In a dramatic struggle, Sullivan taught Keller the word 'water'; she helped her make the connection between the object and the letters by taking Keller out to the water pump, and placing Keller's hand under the spout. While Sullivan moved the lever to flush cool water over Keller's hand, she spelled out the word w-a-t-e-r on Keller's other hand. Keller understood and repeated the word in Sullivan's hand. She then pounded the ground, demanding to know its 'letter name.' Sullivan followed her, spelling out the word into her hand. Keller moved to other objects with Sullivan in tow. By nightfall, she had learned 30 words.

The learning methods and ways of communication used such as braille, touch-lip reading, typing, finger spelling and so on by Sullivan and Keller paved the way and provided hope for people with challenges that learning is possible. Keller was determined to attend college.

After college, Keller set out to learn more about the world and how she could help improve the lives of others. News of her story spread beyond Massachusetts and New England. Keller became a well-known celebrity and lecturer by sharing her experiences with audiences, and working on behalf of others living with disabilities. She testified before Congress, strongly advocating to improve the welfare of blind people. She wrote her biography, *The story of my life*, and went on to form the American Civil Liberties Union (ACLU).

Edited from - https://www.biography.com/activist/helen-keller

Story 6- The power of education- Malala

'The extremists were, and they are, afraid of books and pens. The power of education frightens them. They are afraid of women... Let us pick up our books and pens. They are our most powerful weapons.'- Malala

As a young girl, Malala Yousafzai defied the Taliban in Pakistan and demanded that girls be allowed to receive an education. She was shot in the head by a Taliban gunman in 2012 but survived. In 2014, she became the youngest person to receive the Nobel Peace Prize.

Malala Yousafzai attended a school that her father, educator Ziauddin Yousafzai, had founded. After the Taliban began attacking girls' schools in in her town, Yousafzai gave a speech in Peshawar, Pakistan, in September 2008. The title of her talk was, 'How dare the Taliban take away my basic right to education?'

On October 9, 2012, a gunman shot Yousafzai when she was traveling home from school as the Taliban was against the education of girls. She survived and has continued to speak out on the importance of education. In 2013, she gave a speech to the United Nations and published her first book, *I Am Malala*.

Edited from - https://www.biography.com/activist/malala-yousafzai