PREFACE

"Study the science of art. Study the art of science."

Leonardo Da Vinci

STEAM is an educational discipline that aims to spark an interest and lifelong love of the arts and sciences in children from an early age. Science, Technology, Engineering, the Arts and Math are similar fields of study in that they all involve creative processes and none uses just one method for inquiry and investigation. Teaching relevant, in-demand skills that will prepare students to become innovators in an ever-evolving world is paramount, not only for the future of the students themselves but for the future of the world.

STEAM empowers teachers to employ project-based learning that crosses each of the five disciplines and fosters an inclusive learning environment in which all students are able to engage and contribute. As opposed to traditional models of teaching, educators using the STEAM framework bring the disciplines together, leveraging the synergy between the modeling process and math and science content, for example, in order to blur the boundaries between modeling techniques and scientific/mathematical thinking. Through this holistic approach, students are able to exercise both sides of their brain at once.

An important part of this educational approach is that students who are taught under a STEAM framework are not just taught the subject matter but they are taught how to learn, how to ask questions, how to experiment and how to create.

The goal of this guide is to provide instructional tools in line with the National Curriculum of Pakistan, and it will be useful for teachers of students in all grades. It presents a teaching approach that encourages the active participation and involvement of students in the learning process, with an appropriate balance between thinking and hands-on activities. Sometimes students will be engaged in discussion, and if teachers use questioning effectively, it can improve their students' thinking and communication skills.

To make the guide user-friendly, simple step by step instructions are provided.

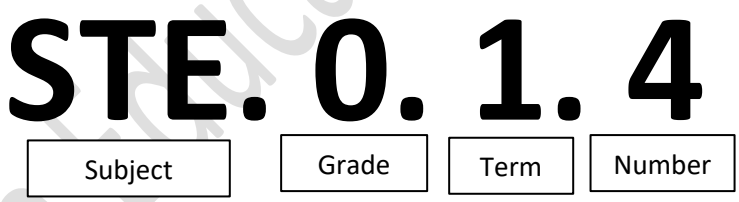
A total number of periods is also suggested for each unit, but the amount of time needed to complete each unit or activity may vary according to its degree of difficulty and the abilities and skills of the students. Teachers can adjust the times to suit their particular needs and context. Advanced preparation and clear instructions by teachers will help to minimize classroom management problems.

All materials suggested for the activities should be easily available at low/no cost: alternative materials can be substituted if necessary.

HOW TO USE THIS GUIDE

Following the simple guidelines can help you get most out of these lesson plans. However, as all teachers know, in order to deliver the best lessons you should be thoroughly familiar with the subject matter before you plan your lessons.

1. Always read the lesson plans thoroughly before the class to maximize confidence and command over your teaching. It will also enable you to modify in advance the plans to suit the needs of your particular students.
2. Collect and test all the materials listed in the plan before the lesson in order to obtain the required results. This will also minimize classroom management problems.
3. Instead of giving your input directly, introduce the key vocabulary using the glossary or dictionary. Involve the students in exploring the meanings of the key vocabulary using the glossary and if any meaning is not there, ask them to look up the meanings in a dictionary. You can also prepare flash cards for the new terms and display them on the walls. Before starting your lesson, ask the students to read these words aloud and share their meanings. This will help your students improve the pronunciation of the new scientific terms and their fluency in using these terms in discussion of the topics.
4. Before any activity, give clear instructions about what, how, and why they are going to do it.
5. Each additional worksheet has been coded according to the following criteria.



6. The concept of STEAM education is new for everyone. If a child takes longer time than you had anticipated, adjust accordingly. Always be appreciative of the work done in class.

We hope that this guide will prove useful in making the learning and teaching something to be looked forward to and enjoyed by teachers and students alike.

IQRA ZAHID

DEPARTMENT OF ACADEMICS

THE NEXT SCHOOL

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DAILY LESSON PLAN

Class: KG **Term 2** **Lesson 1 and 2**

Project: Concept of flying a cargo airplane and the science behind it: **Airplane Challenge**	**Duration**
	70 min

Learning Objectives: **At the end of the lesson, students will be able to**

- Learn about the forces that make your plane SOAR!
- Enjoy solving problems

Teaching Objectives: Teacher will

- Help and teach the children about science, technology, engineering and math, all while building their brains and making connections through problem solving.
- Help the children participate in collaborative conversations about the topic.

Skills involved:
Thinking skills · Problem Solving · Communication · Creative Thinking

Resources required:
·Paper ·Measuring tape ·Coins for lifting weight
https://www.youtube.com/watch?v=qhuRw88A-8c

Instructions:

Warm up: Discuss with students the concept of airplane and cargo by showing them the above video how we are going to make a cargo plane today.

Challenge: Make a paper airplane that can carry a cargo and glide more than ten feet (not be hurled, but actually glide). The cargo we decided on was money-coins.
For making a plane follow the instruction which is given with the planner.

In this first challenge the goal is **accuracy.** The cargo paper planes need to demonstrate they can fly through a target successfully, for instance mark a line on the floor 10 feet from the doorway you will use for the target.

Evaluation/Reflection:

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Signature of the teacher Signature of the Head/Coordinator

THE NEXT SCHOOL

DAILY LESSON PLAN

Class: KG **Term 2** **Lesson 3 and 4**

Project: Build students' experience with computers: **My Online Neighborhood**	**Duration** 70 min

Learning Objectives: At the end of the lesson, students will be able to

- Discover that the internet can be used to visit faraway places and learn new things.
- Compare how staying safe online is like staying safe in the real world.

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Teaching Objectives: Teacher will

- Explain rules for traveling safely on the internet.
- Help the children participate in collaborative conversations about the topic

Skills involved:

Thinking skills · Problem Solving · Communication · Self-management

Resources required:

·Computers ·Laptops or tablets

Instructions:

Warm up: ask the students What do you need to do to stay safe when you visit new places?
Invite students to respond. Answers will vary, but reinforce the following safety rules:

- **Always go places with an adult.**
- **Don't wander off on your own.**
- **Talk only with people you know.**

Say: Today we're going to talk about how visiting places on the internet is a lot like visiting places in real life. Just like there are rules to keep safe when you visit new places in the world, there are ways to keep yourself safe online.
Define **online** as using a computer, phone, or tablet to visit a website or app.
Invite students to respond. Sample responses**:**
He likes to visit cool places.
He can talk to his family and friends.
He can learn lots of new things.
He can create things on the internet.
For demonstration click on the link: https://youtu.be/vNpkUyEOa_8

After giving the proper demonstration of the lecture now click on the below link to start the puzzle
https://studio.code.org/s/coursea-2021/lessons/1/levels/1

Evaluation/Reflection:

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Signature of the teacher Signature of the Head/Coordinator

THE NEXT SCHOOL

DAILY LESSON PLAN

Class: KG **Term 2** **Lesson 5 and 6**

Project: Maze-building challenges with basic coding concepts: **Make your Own Kodable Mazes**	**Duration** 70 min

Learning Objectives: At the end of the lesson, students will be able to

- Create their own drawings and games.
- They will know the direction by using dragging and dropping of the arrow

Teaching Objectives: Teacher will

- Ask leading questions to get the student to spot an error on their own.
- Define the fundamentals of computer science with dragging & dropping of the blocks.

Skills involved: Thinking skills · Problem Solving · Creative thinking

Resources required:
Computer having internet on it
https://game.kodable.com/play?hc=1&type=school&user=j7f4jnq&showSpace=hoc&videos=null

Instructions:

Warm up: Have a good discussion around the computer lab expectations to make sure that students understand the rules. Some topics of discussion might include:

- Is running in the computer lab, okay?
- How loudly should we walk when we are in the computer lab?
- What should you do if you get stuck on a puzzle?
- If you get frustrated, will it help to hit the computer?
- When we're about to go to the computer lab, how should we get ready?
- Now make sure to prepare the lab before the class starts with an 'hour of code' opened in it.

Step 1: There is an introductory video open that video and tell the students what we are going to do in our activity.
Step 2: Students can build a symmetrical maze,
Step 3: Giving them the concept of right angles and directions as well.
Step 4: Get creative and ask them to complete maze-building challenges with basic coding concepts.

Evaluation/Reflection:

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Signature of the teacher Signature of the Head/Coordinator

THE NEXT SCHOOL

DAILY LESSON PLAN

Class: KG **Term 2** **Lesson 7 and 8**

Project: Identify the process of planning and designing the structure by selecting a famous landmark: **Prepping the STEAM Landmark Challenge**	**Duration** 70 min

Learning Objectives: At the end of the lesson, students will be able to

- Identify the famous landmarks.
- Learn about the history happened and it can serve as a catalyst for sparking children's imagination and showing them a world beyond the classrooms

Teaching Objectives: Teacher will

- Use different picture words to tell them the history about the selected landmark.
- Enable the students to acquire the knowledge about the topic
- Help the children participate in collaborative conversations about the topic

Skills involved:

Thinking skills · Communication ·

Resources required:

·Lego Building Blocks ·Printed Challenge Cards

Instructions:

Warm up: Pick one by one student from a class and ask them to tell the class which famous place you visited recently and how they feel after visiting?

Now tell them about different landmarks by showing them cards or media pictures.

Print the challenge cards on cardstock to give them extra durability and cut apart the pieces.

To help ensure that our set stayed together, punched a hole in the upper left-hand corner of each card and bound them with a ring. Mark the four landmarks: The White House, Eiffel Tower, the Giza Pyramids and Kukulkan Pyramid and printed all the sheets.

Building Famous Landmarks

The students are work through the complete process of planning and designing their structure before diving into the LEGOs

Once they had a solid plan in place, they started building their structures.

Evaluation/Reflection:

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Signature of the teacher Signature of the Head/Coordinator

THE NEXT SCHOOL

DAILY LESSON PLAN

Class: KG **Term 2** **Lesson 9 and 10**

Project: Make numbers from the Lego Bricks and do the counting of the bricks**: Number building from Lego**	**Duration** 40 min

Learning Objectives: At the end of the lesson, students will be able to

- Count, add, subtract consistently when they play with LEGO bricks
- developing problem-solving skills and produce new ideas

Teaching Objectives: Teacher will

- Help them to develop on their mathematical skills and spatial awareness
- Help them to make numbers with help of Lego
- Also help students to recognize the number and number count as well.

Skills involved:
Thinking skills · Problem Solving

Resources required:
·Lego Building Blocks

Instructions:

Warm up: Ask the students let's recall the counting
Say: Let's start forward counting in a louder voice
When all the students are done!
Say: Now backward counting

When they are done, ask them to make numbers from the Lego Bricks and do the counting of the bricks. How many bricks are you using to make a number? This will help students to recognize the number and number count as well.
After making numbers from 0 to 9 ask them to put the numbers in pairs and tell me which number is this now?

Evaluation/Reflection:

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Signature of the teacher Signature of the Head/Coordinator