PROJECTS

Meaning of Projects:

- These are assignments given to the learners to be done over a period of time.
  - They involve also using the 21st century skills.
  - They are done either individually or in groups depending on the nature of the project.
  - The teacher should monitor the progress of the learners.
  - Learners should document the developmental stages of their project and they should have presented to the teacher for guidance and as evidence of the work done.
  - At the end of the specified time, the learners are required to present a product or an output and evidence of the progress.
  - The evidence should be presented in a portfolio.
  - Learners are expected to come up with a tangible product focused on genuine issues or problems.

  *NB: **A portfolio** is a collection of learner's evidences of achievements on an implemented project.*

It is important to note that:

- Learners should be in the know of the parameters to be used to evaluate the project.
- At every stage of the project learners will present their project to the teacher for guidance. `
- For group projects the teacher should assess individual learners for their participation and
- Contribution towards the project. For such projects all group members earn the same score.

21st CENTURY SKILLS.

- Are the knowledge, life skills, career skills, habits and traits that are critically important to learners to succeed.

Reason for the 21st century skills.

- Higher education and business leaders consider soft skills as being most important driver of success in higher level courses and in the work place.
- Social media has changed human interaction and created new challenges in navigating skills.

Hence,

We live in a problem-based world. The use of projects empowers learners to engage with 21st century challenges.

21st Century Skills:

- Innovation
- Time Management
- Research skills
- Values
- Risk taking/ Willingness to fail
- Critical Thinking
- Problem solving
- Creativity
- Collaboration
- Communication
- Technology

DIFFERENCES BETWEEN PERFORMANCE TASKS AND PROJECTS

a) *Performance tasks are*:

- shorter in duration
- focused on a single subject
- more structured
- may or may not have authentic contexts
- may only have the audience as the teacher

b) *Projects are*:

- Longer term
- Interdisciplinary
- Open ended
- Focused on real life issues and problems
- Real audience
- Student directed

Primary Criteria for Performance Tasks:

1. The task aligns with standards/learning outcomes
2. The task requires APPLICATION and requires extended thinking, not simply recall or formulaic responses
3. The task has a context, a realistic purpose, a targeted audience, and genuine constraints
4. The task requires explanations, not just an answer

5. The task includes criteria/rubrics for assessing performance
6. The task directions for students are clear
7. The task allows for students to demonstrate their understanding

IMPORTANCE OF PROJECTS

The use of projects promotes the following;

i. Innovativeness
ii. Creativity
iii. Problem solving
iv. Collaborative skills
v. Time management
vi. Research skills
vii. Critical thinking
viii. Values
ix. Creativity.

FEATURES OF A PROJECT:

Whereas a project is expected to have a life span, in this context, it is meant to empower development of learners' innovativeness and creativity to address societal challenges and to appreciate learned competences for advancement of life. The under listed features may slightly differ from the conventionally known characteristic project features.

Therefore, for purposes of this curriculum the features of the project are;

- **Uniqueness**: No two projects are exactly similar even if they are exactly identical or are merely duplicated. The location, the infra-structure, the agencies and the people make each project unique. The project should depict creativity.
- **Life cycle**: A project has a life cycle reflected by growth, maturity and decay. It has naturally a learning component.
- **Efficiency**: Project Efficiency can be measured by the volume of outputs obtained per the inputs utilized. Some factors influencing a project's efficiency:
  - Technologies used in the working processes (the better technology used, the more economical their rate of efficiency is);
  - Quality of planning (the more qualified and deliberated project planning is applied, the easier it is to forecast and keep proper efficiency level);
  - Quality of operational management (how effectively the resources are managed when they are immediately in utilization or operation);
  - External factors which are hard to forecast (disasters, emergent levels of key staff members, bankruptcy of stakeholders, etc);
- **Effectiveness**: A project must satisfy/meet or exceed the planned targets.
- **Team-work**: A project calls for team-work. In this context, a team is constituted of members belonging to the same class, or may be selected by the teacher from different streams where they exist for purposes of avoiding unhealthy competition.

- **Environmental friendliness**: A project should not have negative impact on the environment. From the onset, learners should always be made conscious of the significance of the environment. Therefore, an Environmental Impact Assessment (EIA) should be addressed with great concern.
- **Sustainability**; A project is expected to be disseminated for addressing the intended societal challenge and a simple write-up made for the beneficiary's reference and future improvement.

Every project should exhibit a degree of innovation and creativity in addressing a societal challenge.

TYPES OF PROJECTS

1. **Simple and routine:** These are simple and have **direct process lines** and require limited resources e.g. in R.E., finding out methods of worship in the community and how they build relations. In Geography, the activities in the community and how they affect local climate. These involve simple investigating, recording, and reporting.

2. **Simple and non-routine:** These are *innovations* with creativity which have a **direct process line** though **extra ordinary** in nature but require limited resources. e.g., inventing other uses of cassava than the usual.

3. **Complex and routine:** These are innovations which are **unique**, achievable but do not have a direct process line, changes form, requires continuous research, and demands more resources and highlights creativity, e.g., why people in the same area build houses facing the same direction and why they use particular materials.

4. **Complex and non-routine** : These are innovations which are **unique**, they cannot be easily achieved due to **uncertainties**, being **interdisciplinary,** are creative in nature.

NOTE: *In the LSC context projects will be limited to types* **1** *and* **2**.

DEVELOPING PROJECTS (COMPONENTS OF PROJECT)

While developing a project plan, always consider these as the components of project;

a. **Identification of the project:** Title (aligned to the theme); Objectives (i.e., success criteria)
b. **Organisation:** Planning, Methodology, Resources, Drafting, Implementation, Creating a portfolio and documenting

c. **Report writing**

Key Criteria for a Cohesive Project.

Quality cohesive project must possess the following;

1. The project includes both subject content and 21st century skills
2. The project is based on a challenging problem or question
3. The project requires sustained inquiry by students
4. The project is authentic:
    a. Presents a real-world challenge
    b. Uses real-world processes/tasks/tools/and performance standards
    c. Has an impact on others
    d. Addresses personal interests of students
5. Students have choices:
    a. Identifying the topic focus and generating questions
    b. Specifying task(s) and role(s)
    c. Determining and accessing needed resources
    d. Deciding on culminating products
6. The project results in a public project for a genuine audience
7. The project includes opportunities for feedback and revision
8. The project allows for students' reflection.

MATERIALS FOR PROJECTS

- Schools are advised to guide the learners to identify projects which can be done using materials which are locally available and affordable. Use low cost materials, e.g., waste materials like plastics.
- Schools are encouraged to use materials which are in line with "Buy Uganda Build Uganda" (BUBU). By so doing the project work will be promoting industrialization for employment, inclusive growth, and wealth creation.
- Materials should be environmentally friendly.

Design Variables for Projects

- Time Frame
- Integration of Subjects
- Cognitive Demand/Rigor
- Level of Inquiry
- Degree of Authenticity
- Intended Audience
- Performance Mode
- Level of Self-Direction
- Level of Student Choice
- Access to Resources
- Degree of Support
- Evaluation of Performance

REPORT COMPONENTS FOR PROJECT.

While writing a report for the project to be presented to the teacher at end of the project, it should contain the following;

- Title
- Time frame.
- Materials used.
- Problem solving.
- Procedure (Steps taken)
- Explanation
- Justification from the project (How it works
- Challenges faced during the carrying out of project.
- Conclusion.
- Members involved. (Starting with the leader)

Teacher's role:

In project based learning and assessment, the teacher is expected to:

- Make observations
- Hold conversations

Formative Assessment

- Provide guidance and support the learner
- Keep records
- Receive a product and report

This is continuous throughout the project lifetime.

NB: ***For generic skills, a teacher should use those which fit the project.***

HOW MANY PROJECTS SHOULD A LEARNER TAKE IN A YEAR?

- A learner will have a maximum of two projects every term provided that by the time the learner sits for final UNEB examinations, a project in each of the subjects registered for has been completed and submitted for assessment.

  For example, if a student sits for eight subject examinations, that student will have completed at least one project in every subject.

AWARDING SCORES IN A PROJECT.

3 = The characteristic is strongly reflective in the performance

2 = The characteristic is somewhat reflected in the performance

1 = The characteristic is not YET reflected in the performance task

1) HOW TO DESIGN RUBRICS IN PROJECTS.

- ***Meaning of Rubric:***

➢ A rubric is a scoring guide used to evaluate performance, a product, or a project. It has three parts namely;

i. Performance criteria.
ii. Rating scale.
iii. Indicators.

The rubric defines what is expected and what will be assessed hence indicating that a teacher will evaluate according to specified criteria, making grading and ranking simpler, more transparent and fairer.

Rubrics can be made easily for feedback and evaluation (Rubrics give clear targets, progress monitoring opportunities, and guidelines for self-assessment.)

▪ How to design a rubric.

- This process begins by identifying the basic rubric components or parts as indicated above. (the performance criteria, the rating scale and the indicators of the performance).

Designing Rubric in projects involve two sections namely;

- ✓ Types of criteria.
- ✓ Basic design criteria of a Rubric.

a. Types of criteria.

While designing Rubrics for a given project, the following types of criteria are used.

- **Content criteria**: facts, concepts, principles

"accurate" "clearly explained" "complete" "expert" "knowledgeable" (award 3,2 or 1)

- **Process criteria**: effectiveness of the methods and procedures *"collaborative" "coordinated" "efficient" "methodical" "precise" (award 3,2 or 1)*

- **Quality criteria**: evaluation of overall quality and craftsmanship of product or performance *"creative" "organized" "polished" "well crafted" (award 3,2 or 1)*

- **Impact criteria**: overall results given the purpose and audience *"entertaining" "informative" "persuasive" "satisfying" "successful" (award 3,2 or 1)*

NB: Due to the above criteria, project can be on atleast **2** criteria.

b. Basic Design Criteria of a given Rubric.

These are the guidelines for assessing in a project.

1. Does the rubric contain criteria derived from the targeted standards/outcomes? (3, 2, 1)
2. Does the rubric include all relevant traits associated with successful performance? (3,2,1)
3. Are the scales of the rubric sufficient to accommodate a full range of levels of performance or degrees of understanding? (3,2,1)
4. Is the language of the rubric specific enough to provide useful feedback as well as to guide reliable scoring? (3,2,1)
5. Are the descriptive terms used to distinguish performance levels parallel across the scale? (3,2,1)

6. Is the rubric written in student-friendly language to enable student self-assessment? (3,2,1)

- **Determining the criteria to use.**

Always figure what areas really matter to the quality of the project work that is being produce hence determining what evidence you want in the final product.

Do the following always,

- ❖ List all the possible criteria you might want students to demonstrate in the project including criteria for the process of creating products and the quality of product.
- ❖ Decide which of those criteria are "non-negotiable". Ideally your rubric will have three to five performance criteria.
  If you are having hard time deciding, prioritize the criteria by asking
  i. What are the learning outcomes of this project?.
  ii. Which learning outcome will be listed in the rubric?
  iii. Which skills are essential at component or proficiency levels for the project to be complete?
  iv. How important is the overall completion of the project?

- **Developing indicators of quality.**

Always define the performance quality of the ideal assessment for each criteria, one at a time.

Begin with the highest level of the scale to define the top quality performance. Remember, this is the level that you want all students to achieve and it should be challenging.

Therefore, for quality indicator,

- ✓ Create indicators that are present at all performance levels.
- ✓ Make certain there is continuity in the difference between the criteria for exceeds Vs meets, and meets Vs does not meet the expectation. The difference between a 2 and a 3 performance should not be more than the difference between a 3 and a 4 performance.
- ✓ Edit the indicators to ensure that the levels reflect variance in quality and not a shift in importance of the criteria.
- ✓ Make certain that the indicators reflect equal steps along the scale. The difference between a 4 and a 3 should not be equivalent to the difference between 3-2 and 2-1. "Yes, and more", "Yes," "Yes, but", and "No" are ways for the rubric developer to think about the performance at each scale point.

CHECK LIST USED IN ASSESSING PROJECTS

The check list below is used to assess a project

Project Title:

Phase		Indicators	Max Score
1.	Identification, Planning/design	Title	.....
		Alignment to the theme	.....
		Justification of the project	.....
		Methodology	.....
		Identification of Resources (materials and tools)	.....
			X/.....
2.	Project Implementation	Organisation/Sketching/drafting	.....
		Steps/Procedure	.....
		Use of Resources (materials and tools)	.....
		Generic skills and Values applicable to the project (Critical thinking, ICT proficiency, Communication, Creativity and innovation, Honesty, Respect, Hard work, Integrity, Social harmony, National Unity, National consciousness and patriotism)	.....
			X/.....
3.	Product	Originality	.....
		Creativity and innovation	.....
		Accuracy	.....
			X/.....
4.	Project Report		
		Relevance	.....
		Accuracy	.....
		Coherence	.....
			X/.....
Total		.....	

NB: FROM THE ABOVE, AFTER OBTAINING SCORE FOR EACH INDICATOE IN EACH PHASE, THE OVERALL TOTAL IS OBTAINED

Example of Rubric for "*some*"Phase.

Areas assessed	**Great /3**	**Moderate /2**	**Not quite /1**
Organisation			
Content			
Team work			
Score	.....		

NB:

- *Scores depend on the indicators used hence no "**dictative**" maximum scores and thus depend on rubric in each phase from the table of assessing project.*
- *Each indicator item earns a maximum of 3.*
- *Awarding individuals in project is done by participation in case it is done in a group.*
- *Theme can be the title.*
- *Examples of analytic and holistic rubrics are easy to find using a **Google search. Key words: "analytic rubric, performance task" or "analytic rubric, biology, project", and so on.***

Additional considerations related to rubrics:

- Rubrics need to be piloted, or field tested to ensure they are measuring the variable intended by the learner.
- Rubrics can be discussed with learners to create understanding of expectations.
- Rubrics ensure that scoring is accurate, unbiased and consistent.
- Rubrics list expectations of a learner performance that are aligned with the conceptual lesson or unit delivered. Students should not be expected to do what they have not been previously taught or shown.

IMPORTANCE OF PROJECT ON FINAL NATIONAL END OF CYCLE ASSESSMENT.

- Scores for each parameter will be determined by the teacher. The total score for the project will be scaled to 10%. This will be added to the 10% score from the Activities of Integration to account for the 20% score of the end of cycle summative assessment.
- A learner who has not been assessed at school level does not qualify to be assessed at the end of cycle National Examinations. **UNEB** will actualise this through regulations.

EXAMPLE OF PROJECT.

An example of a sample project is Tomato Sauce which is under Vegetable Processing in Nutrition and Food Technology.

Sample Project:

Project title: MAKING TOMATO SAUCE.

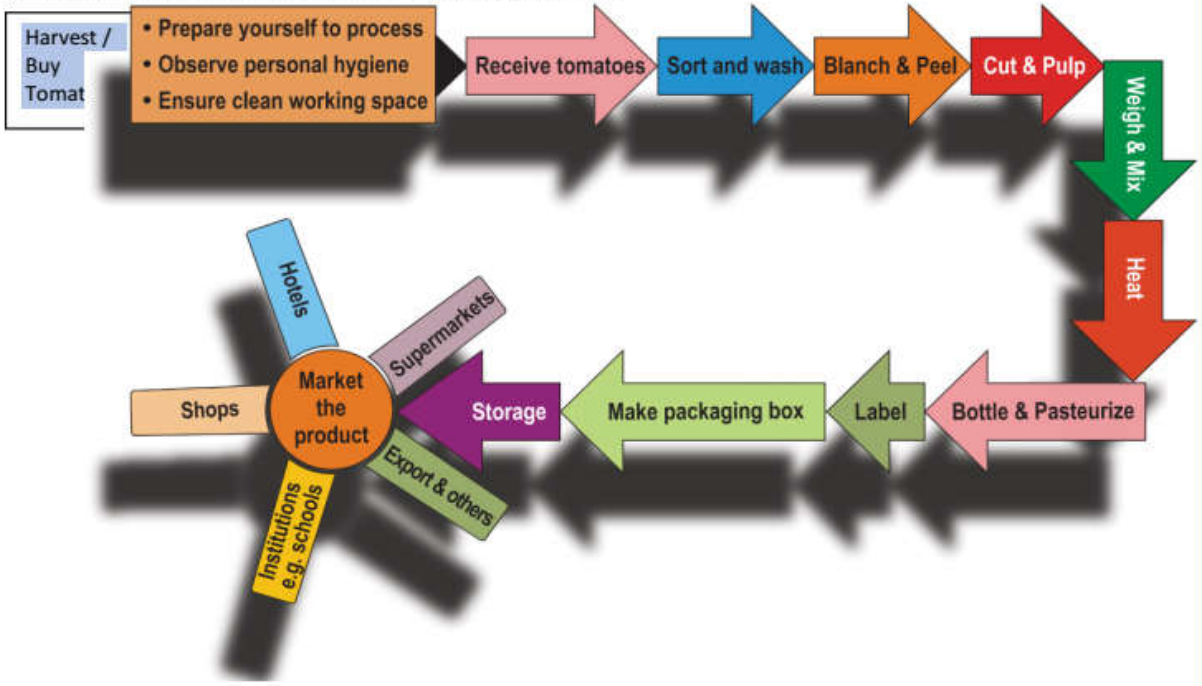
The cycle will follow all the steps:
Sourcing raw materials and equipment →Processing →preserving → packing →marketing
In this way , learners will appreciate the fundamental thrust of the subject. This is the full integration of everyday life concerns into schoolwork. The Nutrition and Food Technology involves projects which encourage the use of local raw materials.

Questions for discussion

- What are the various ways of using a ripe tomato fruit?
- How are ripe tomato fruits prepared for cooking?
- What is the importance of processing and preserving tomatoes?

The Tomato Sauce project illustrates the steps of the project cycle.
A flow chart is a good way to represent the project cycle.
Here is the flow chart for the Tomato Sauce project. It presents the work sequence of making tomato sauce. It helps to make the work flow in an organized way.

Flowchart of the Tomato Sauce making process



Study the steps in the sequence. This gives you an overview of what you will be doing.

- Comment on the sequence for making tomato sauce.
- What equipment would you need to do this work?

Ingredients

To make Tomato Sauce, you need the following ingredients:

Ingredient	Quantity notes
Tomatoes	Main raw material
Onions	Flavouring
Sugar	sweetener
Salt	Seasoning
Cinnamon	Seasoning / flavouring
Cardamom	Seasoning / flavouring
Cumin	Seasoning / flavouring
Mace	Seasoning / flavouring
Black pepper	Seasoning
White pepper	Seasoning
Ginger	Flavouring
Vinegar	Flavouring and preservative
Sodium Benzoate	Preservative

Note: Sodium Benzoate can be procured from shops selling chemicals.

Equipment and tools needed to process tomato sauce:

- Bowl and buckets
- Draining racks
- Protective wear (latex gloves; hair nets)
- Cooking pans
- Knives,
- Heat source- a stove, Electric or Gas cooker.
- Chopping board/ surface
- Bottling capper and filler (optional)
- Muslin cloth or bag
- Stirrer or mingling stick
- Gloves
- Cleaning towels/mops
- Glass Bottles,
- Apron

CONCLUSIONS.

- ✓ A project-based approach to learning can help educators engage students in thinking deeply about content, while also learning critical thinking, communication, and collaboration skills.
- ✓ Project-based learning connects students to their learning in ways that traditional instruction often doesn't. Also, students love it!
- ✓ Projects shall be based on themes to be identified annually by NCDC and disseminated to schools across the country. The themes shall be reflecting national concerns. However, at school level the project ideas shall be identified and developed by the learners in alignment with the themes under the guidance of the teacher in consultation with resource persons (e.g. job-related practitioners/experts).