

Designing Worksheets for Meaningful Learning

Aanchal Chomal

Introduction

In the last two years of the pandemic, student learning has been severely impacted due to frequent school closures and ineffective online learning alternatives. During this time, we have observed several schools and governments implementing worksheets as one of the teaching-learning materials (TLM) to maintain continuity of student learning and address the widespread and serious nature of learning loss. However, the effectiveness of these worksheets in furthering student learning will depend on how they have been designed. To what extent do these worksheets address the learning loss that has occurred in the last two years? During school reopening and for some time after that, investing time and effort in the designing of effective TLMs that can supplement students' learning will be paramount and teachers will need to take a lead in developing these.

Worksheets are the most commonly used TLMs and teachers are often not provided with any guidelines or instructions on designing worksheets. As a result, often worksheets end up being practice sheets merely aimed at reproducing facts learnt from the textbooks; or for drill and practice of certain skills; or for copy writing, colouring etc. Very often, these types of worksheets keep students occupied but may or may not lead to any meaningful learning.

This article is primarily aimed at helping teachers in designing effective worksheets that can support continuity in students' learning. A few design principles that are guided by sound pedagogical considerations are discussed.

What is a (good) worksheet?

In a blog post,¹ Jennifer Gonzalez suggests that most worksheets fall within a continuum of 'busysheets' and 'powersheets'. Busysheets are the kind of worksheets that keep students occupied in some way, 'where students are either doing work that's

fairly low-level recall stuff – filling in blanks with words, choosing from multiple-choice questions, labelling things – or work that has no educational value at all, like word searches, word scrambles, or colouring, even when colouring adds no extra layer of understanding.'

In contrast to busysheets, powersheets are learning tools which engage the student in meaningful learning, such as the learning of a skill, its application or a self-learning tool. It is, therefore, significant to develop an understanding of the principles and processes of designing worksheets that function as powersheets.

Principles for designing good worksheets

The principles of designing good worksheets could be broadly split into two categories, one, related to content and pedagogical considerations and two, related to the designing of the worksheets – the layout and presentation.

a. Content and pedagogical considerations

- i. Worksheets should address key learning outcomes and foundational competencies:

Due to the massive learning loss that has occurred in the last two years, worksheets should be grade-agnostic, that is, they should not be based on any grade-specific textbook. They should be designed keeping in mind the learning outcomes and competencies relevant to the subject. In addition to being grade-agnostic, it is equally important for the worksheets to address pre-requisite outcomes of at least two grades below the grade that the child is currently studying in. This means that while designing a language worksheet for a class III child, there should be a few questions/tasks that are of classes II and I.

Illustratively, for a class III worksheet on writing, the outcomes that can be addressed in the worksheet can be organised as shown in the Table 1.

Class I-level outcomes	Class II-level outcomes	Class III-level outcomes
1. Draws/scribbles in response to poems and stories	2.1 Draws or writes a few words or short sentences in response to poems and stories	2.1 Writes 5-6 sentences in English on personal experiences/events using verbal or visual clues

Table 1. Source: NCERT Learning Outcomes, Elementary Stage, 2017

ii. Worksheets should include tasks that scaffold and deepen conceptual understanding:

In order to make worksheets an effective learning resource, it is important to design the tasks carefully. One of the foremost principles would be to provide tasks that are not limited to lower-order thinking, such as recalling, copying, and repeating procedures. The tasks should entail the use of conceptual understanding by the learner. That may not be an easy task, particularly due to the interrupted learning in

the last two years. In such cases, some sort of scaffolding tasks should be provided to the child. A scaffolding task, as the name suggests, would support the learner in understanding how to go about solving a given problem. Illustratively, in the next example (Figures 1 and 2), the learner is made to understand how the concept of multiplication is actually repeated addition through grouping. Once learners have gone through the solved example, they are supposed to try out the worksheet on their own.

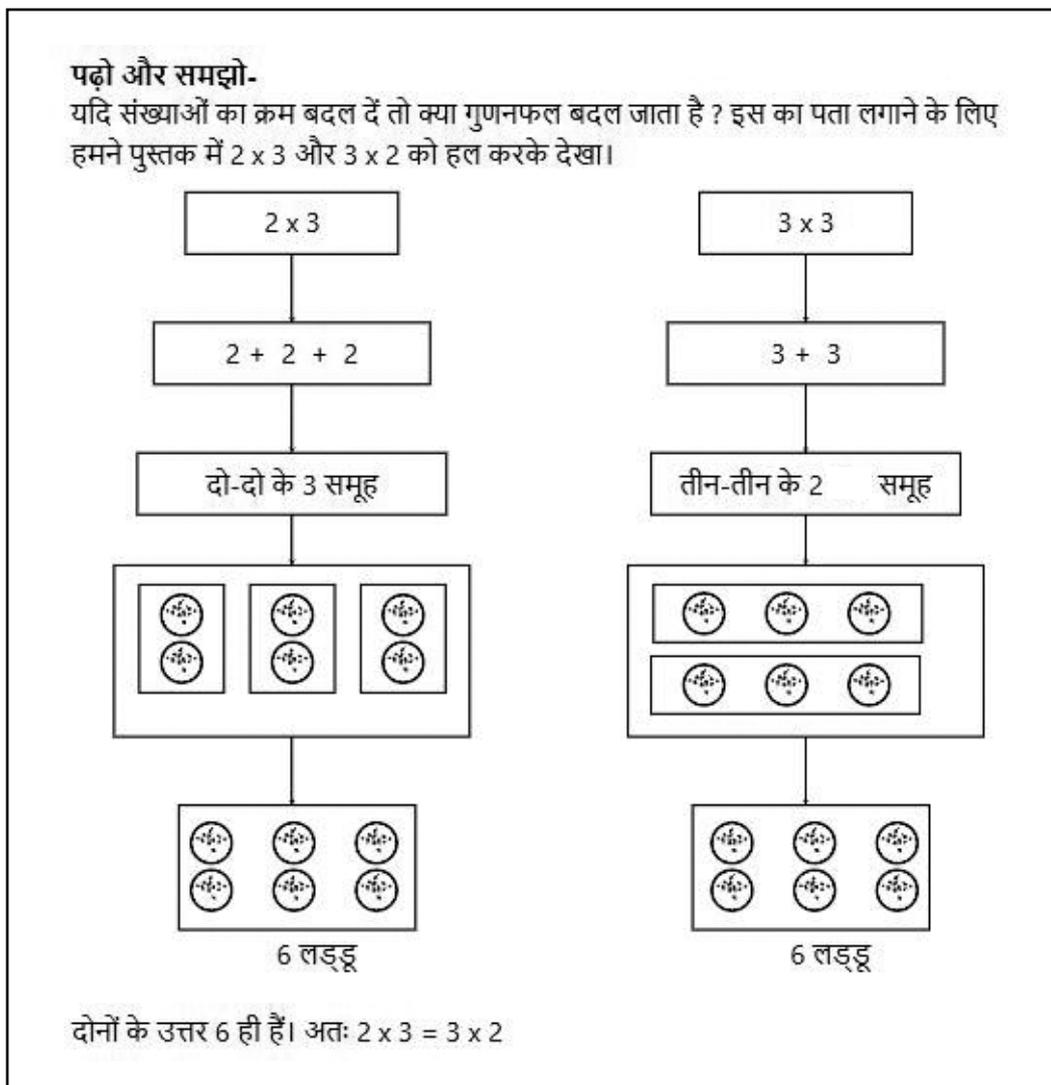


Figure 1. Source: Azim Premji Foundation worksheets, Chhattisgarh, 2021.

एक बार पुनः उसे आप इस अध्याय की शुरुआत में पाठ्य पुस्तक में देख सकते हैं।
 उसके आधार पर निम्न प्रश्नों को हल करें -
 अब आप इसी तरह 4×2 तथा 2×4 को पूरा करो।

क्या दोनों बराबर हैं? _____ अतः $4 \times 2 = 2 \times 4$

Figure 2. Source: Azim Premji Foundation worksheets, Chhattisgarh, 2021.

- iii. Worksheets should include a variety of tasks, including those on higher-order thinking: Since the worksheets must include prior learning, they can have a diverse set of tasks – starting from simpler ones to those that adequately challenge the learner. The worksheets should gradually help the learner in demonstrating the skills of application, analysis and problem-solving. Illustratively, the task given in Figure 3 requires the student to apply both addition and subtraction procedures in an unfamiliar context than those presented in the textbook.
- iv. Worksheets should include authentic materials and tasks for experiential learning: A host of authentic materials that is available in the learner's environment, such as maps,

posters, newspaper articles, food item wrappers, etc. should be used as context and stimulus to create such tasks. The tasks in a worksheet could also be connected to conducting some real-life experiments and recording the data back into the worksheet. Such tasks can be done in groups or pairs where learners get an opportunity to collaborate with their peers to perform the tasks. Illustratively, in the science task shown in Table 2, the learners have to observe key characteristics of soil with some leading questions and note down their observations in the worksheet. Such tasks can provide an excellent start for triggering a discussion in class and connecting these to further concepts in the subject.

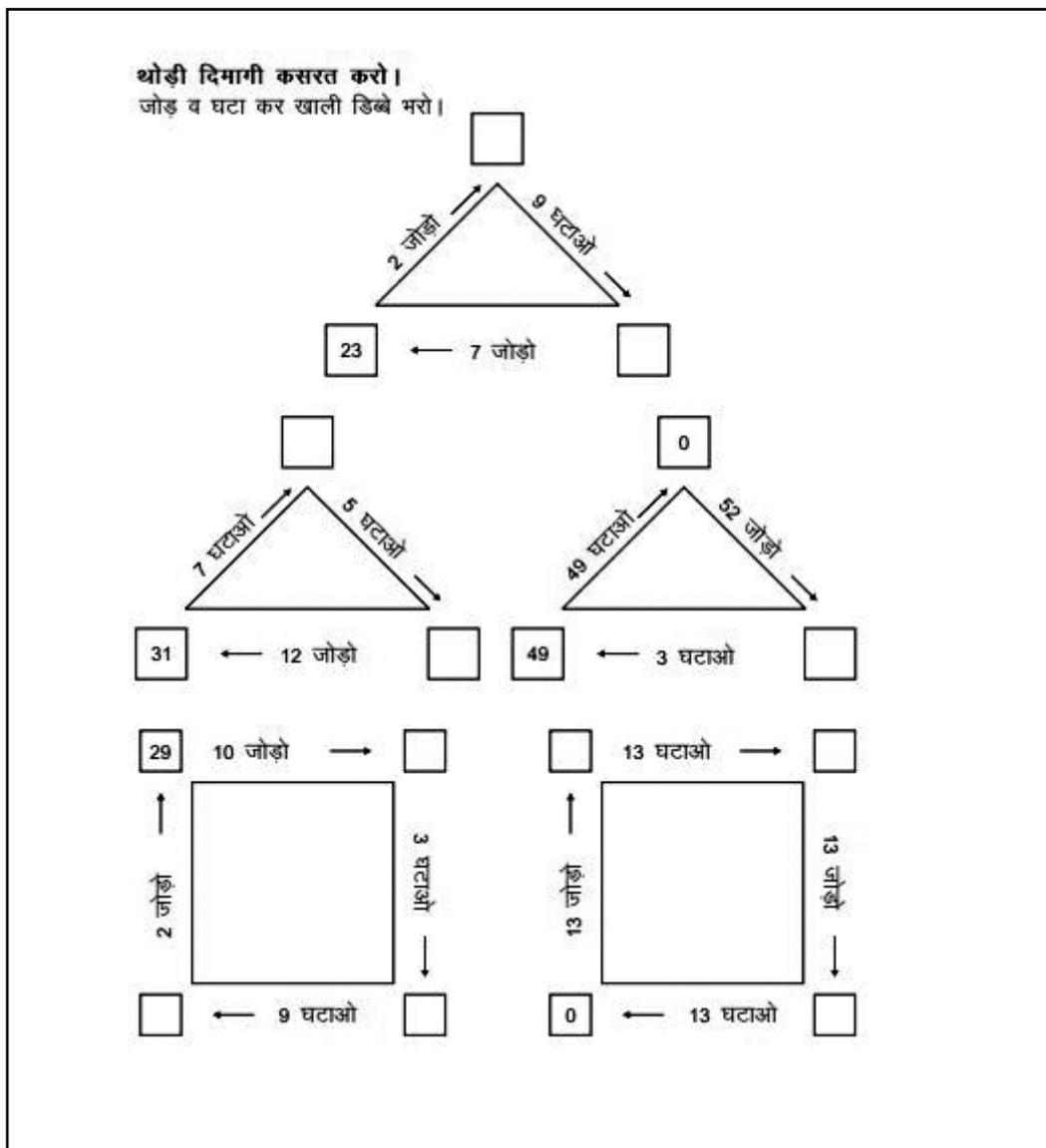


Figure 3. Source: Rajasthan Workbooks, 2007.

EXPERIMENT: EXAMINING SOIL		
Have you ever wondered which properties of soil you could study? Let us make a list and study them:		
Points for observation	Properties	Observations
<ul style="list-style-type: none"> How does the soil look? Is it lumpy, a fine powder or granular? What is its colour - black, brown, red, any others? How does it feel when you touch or press it? Hard, soft, elastic, dry, sticky? How does it smell? Aromatic, foul, no smell? Can you see any living creatures or remains of dead creatures or plants in the soil? 	<ol style="list-style-type: none"> Shape of particles Colour How it feels Smell Living organisms present Remains of organisms Type of soil Moisture Water retention 	

Table 2. Adapted from Bal Vaigyanik Textbooks

v. Worksheets must include self-reflection prompts for learner- and teacher-feedback:

The worksheets should also have a corner for the learner to reflect on and share his/her views on the tasks. In addition to that, the teacher

should also provide feedback to the learners on specific tasks. This would help the learners in understanding what is expected of them in subsequent tasks undertaken.

Self-reflection prompts	Student's responses	Teacher's feedback about student
1. Was I able to attempt all the questions in this worksheet? 2. What tasks/questions did I like the most and why? 3. Which question was I unable to answer and would need more help to answer?		

Table 3. Learner and teacher feedback

Look at the picture below. Observe the different uses of the coconut tree.

ಕೆಳಗಿನ ಚಿತ್ರವನ್ನು ನೋಡಿ. ತೆಂಗಿನ ಮರದ ವಿವಿಧ ಉಪಯೋಗಗಳನ್ನು ಗಮನಿಸಿ.



Note to teacher : Ask questions on how each part of a coconut tree can be used. Discuss how different parts of trees are used at homes.

Figure 4. A worksheet with bilingual instructions

b. Design, layout and presentation

Once the content of the worksheet is finalised using sound pedagogical principles, the next important thing to keep in mind is the design of the worksheet. A few simple things should be kept in mind.

- i. Font size should be large enough for young learners to read the text clearly.
- ii. There must be an adequate number of line spaces to allow learners to express their answers fully.
- iii. The quality of paper used for the worksheets should be good. It should not tear when learners write on it.
- iv. The overall layout and presentation, especially for younger children, should be attractive and inviting.
- v. There should be clarity in the prompts and instructions: It has also been found that the quality of prompts and instructions provided in the worksheets greatly influences students' ability to solve the worksheets. Tasks, in which instructions are specific and simple, are easily solved by the learner. In schools following bilingual medium of instructions, the worksheets could also carry instructions for both teacher and learners in both languages. In the example shown in Figure 4, the EVS textbook of Karnataka that was used in the English medium sections used bilingual instructions to scaffold both the learner and teacher in acquiring proficiency in English.

What could be the uses of such worksheets?

Worksheets when developed meaningfully can

serve multiple purposes.

i. Provide evidence of students' learning and reporting learner progress:

These worksheets demonstrate how well a child has learnt throughout the academic year and can, therefore, serve the function of reliable evidence of learner progress in an academic year. A teacher can extract relevant pages from students' worksheets and maintain records in their portfolios. Such portfolios or box files as they are called in many states provide a comprehensive and consolidated overview of each child's capabilities and areas of strength. This can, in turn, be used for periodic communication with the parents about the child's learning levels.

ii. Collating students' learning levels and planning classroom pedagogy:

If the worksheets are designed keeping the above principles in mind, they can be used as a tool to diagnose students' current learning levels. For instance, after administering a worksheet with a group of 20 students, a teacher may be able to accurately identify how many children in her class are at grade 1/2/3 levels in a particular competency. She can also get a sense of the competency in which her class is the weakest – the one in which most of the children have made mistakes. Such an analysis will enable the teacher to pitch her classroom transaction at a level that matches the level of the students. It will also give her an adequate insight into why students are struggling in learning certain class-level content.

Sl. No.	Name of student	Performs all four mathematical operations	Solves word problems with at least two or more mathematical operations	Creates simple word problems	Supports peers in solving problems
1	Student 1	Y	N	Y	N
2	Student 2	N	N	Y	N
3	Student 3	N	N	N	N
4	Student 4	Y	Y	Y	Y
5	Student 5	N	N	Y	Y
6	Student 6	N	N	N	N
7	Student 7	Y	Y	Y	Y
8	Student 8	Y	Y	Y	N
No. of students needing support		4	5	2	5

Table 4. The teacher could maintain a consolidated assessment record.

iii. *Promote the culture of assessment as learning:* Worksheets designed for learners with space and opportunities for self-reflection through prompts will help students make the transition to assessment as learning. Students will be able to practise self-assessment and reflect upon their strengths and weaknesses. In the lower classes, the teacher may need to scaffold this process closely or use simpler examplesⁱⁱⁱ; however, with repeated practice of using such worksheets, students will be able to self-assess their progress independently.

Conclusion

Worksheets will continue to be a very important TLM in the recovery of learning loss and in supporting students in furthering their learning. The layout and presentation of the worksheets should be simple and attractive, and they should have the right amount of textual material as per the age of the learner and complexity of the concept addressed in the worksheet. The font size,

illustrations, images and instructions used must be clear, simple and unambiguous. In addition to the design, it is also important to develop the content judiciously – worksheets should be seen as a learning resource providing cognitive scaffolding to the student to engage deeply with the learnt concepts. The content in the worksheets should be well-aligned to learning outcomes. A wide variety of tasks ranging from questions and activities to real-world tasks should be included in the worksheets. It is also advisable to sequentially organise the questions or tasks from simple to complex ones.

Apart from the designing of worksheets, it is also necessary to discuss how to use them – as a TLM, these could be used for both self-learning as well as peer/group learning. Well-developed worksheets may also be used as an assessment resource to collect and collate evidences about student learning and help the teacher in planning her lessons more effectively.

Endnotes

- i <https://www.cultofpedagogy.com/busysheets/>
- ii Based on studies conducted by Stanford University
- iii Aanchal C. 2020. Coping with Lost Time, Learning Outcomes and Assessment. Learning Curve Issue XI, Dec 2020. http://publications.azimpremjifoundation.org/2503/1/4_Learning%20Outcomes%20and%20Assessment_Aanchal_Chomal.pdf

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Different state and other materials and textbooks: Karnataka DSERT, *Bal Vaigyanik*, Rajasthan Workbooks.



Aanchal Chomal heads the Assessment function at Azim Premji Foundation. She works across states in providing assessment solutions (frameworks, tools, courses, consultations) for students, teachers, teacher-educators and educational institutions for improving the quality of classroom assessments, certification exams and teacher-eligibility tests. She is a post-graduate in Geography from the Centre for Studies in Regional Development, Jawaharlal Nehru University, New Delhi and a graduate in Geography from Presidency College, Kolkata. She can be contacted at aanchal@azimpremjifoundation.org