



Unit 1

Introduction to Work Breakdown Structure

Learning Outcomes

By the end of this unit the learner will be able to:

- ✓ Define and create a Work Breakdown Structure
- ✓ Identify and understand task relationships

Unit 1

Introduction to Work Breakdown Structure

Projects and Schedules

What is a project?

Why are schedules so important to projects and to our lives?

What benefit do they provide?

Many different factors can affect the planning of a project. What events can affect a project's duration and/or resources?

Can you think of some events that affected projects or production in general?

The Work Breakdown Structure (WBS)

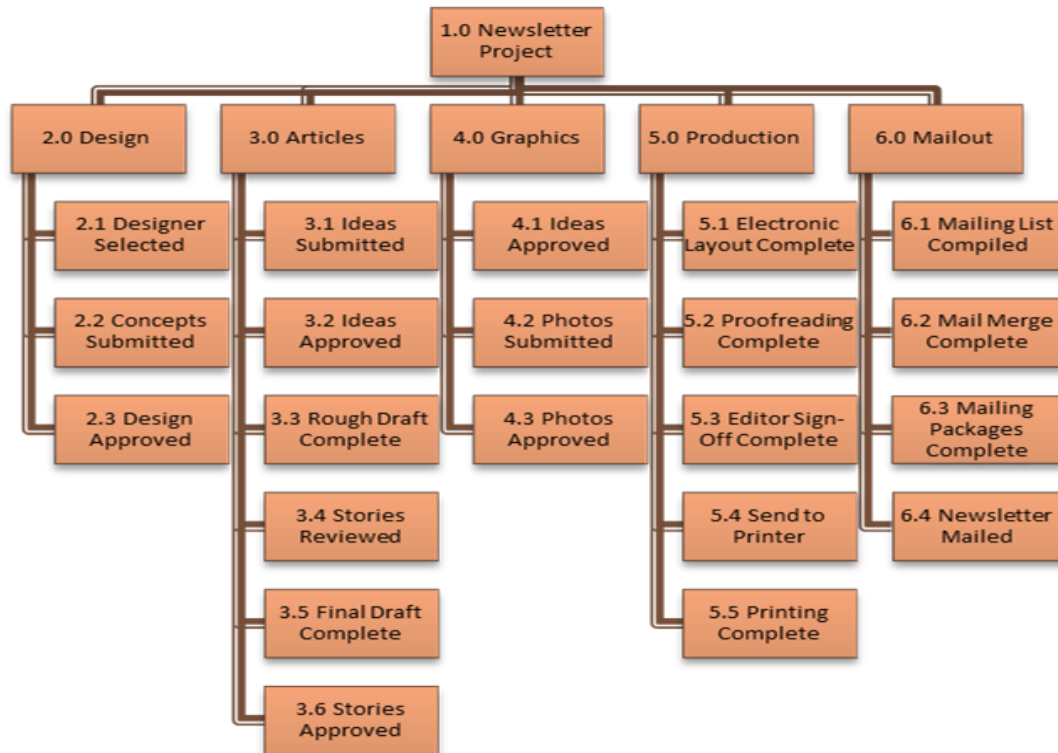
What is a Work Breakdown Structure?

About the Work Breakdown Structure

A Work Breakdown Structure takes the milestones and breaks them down into the tasks required to reach each milestone. The idea of a Work Breakdown Structure (sometimes called Product Breakdown Structure) is to break larger tasks (milestones) down into smaller tasks (activities) or individual components.

Sample WBS

Here is an example Work Breakdown Structure for a newsletter project.



The Role of a Work Breakdown Structure

When a project begins, it's easy to envision the end goal or deliverable. However, it is not always easy to know how you will get from your current state to the end goal. A work breakdown structure will help you identify the steps and activities required to take you from point A to point B of your project.

Work breakdown structures are a means of breaking down a project into manageable deliverables, activities, or tasks that can be assigned to an owner. For example, consider the project of building a house:

- How do you make sure the required work gets completed?
- How do you know what contractor to hire?
- How do you what kind of house you want to build?
- How do you know how much it will cost to build the house?
- How do you even know where to start?

As you can see from the questions listed above, there is no set or clear path on how a project is carried out. Every project is unique in its requirements, duration, and cost. Completing a project is merely working through a pre-determined sequence of milestones/activities that begins with your current state and ends at your final deliverable. A work breakdown structure will help you and your teams identify, organize, and understand the steps required to complete a project. It will also clearly define the project scope.

Creating a Work Breakdown Structure

About the Work Breakdown Structure

Work breakdown structures are created from the top down or from the bottom up. If you're working from the top down, the WBS starts with the project as a single event (e.g. Clean Room, Take a Vacation, Move Houses). You start at the project level and work your way down to figure out all of the pieces that must be completed before your project can finish. If you're working from the bottom up, you start with the smallest tasks and work up to the larger tasks.

You can create a WBS with your project team or on your own. Be sure to get a second (or third) opinion on your breakdown if you are unfamiliar with the project and its outputs. Be sure to list all assumptions and criteria used to create your WBS; this will save you time and questions as you progress through the project.

Steps for Creating the Work Breakdown Structure

Step One: Understand the scope and requirements of the project.

In order to create an accurate WBS, you must first understand all that the project is to encompass. Start this process by going through all documentation you can find (the SOW, RFQ/RFP, etc.) to familiarize yourself with the project scope and criteria, especially if you weren't involved from the beginning.

It is important to remember and make note of the fact that work not indicated on the WBS is out of scope and will not be completed during the project.

Step Two: Identify major areas and tasks required to complete the project.

Once you know the scope of the project, you can then begin to subdivide the project into smaller tasks. Ask yourself, "What has to be done in order to complete this task?" and begin at the project level (Level 1). Write down all of the major components that need to be completed underneath Level 1. The purpose of this step is to get your head around the major events that contribute to project completion.

If your project team is already created, get them involved in this stage of the process, as they are the ones who will be performing the work. They might also have a better idea of the detailed work required to complete each deliverable/task.

Step Three: Continue subdividing Level 2 tasks into actionable items and don't worry about order of events.

Continue to ask yourself the question, "What has to be done in order to complete this task?" to break out the Level 2 tasks. Stop subdividing when you are sure that all tasks under the top level have been accounted for, or until you have reached the desired degree of time measurement (hours, weeks, days, or months).

There is no limit to the number of levels you use in the WBS; some tasks will have many levels underneath, while others might only have one. The lowest level of each branch in the hierarchy is called the work package.

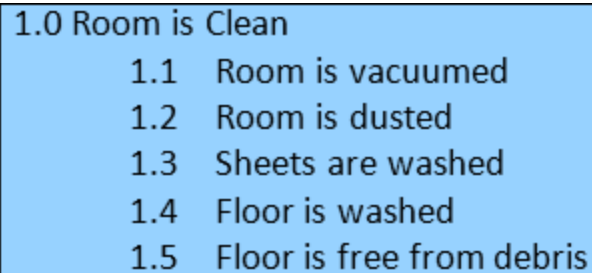
At this point, do not worry about the order in which the tasks must be carried out. Just write down as many activities as you can about milestones/deliverables that need to be completed.

Step Four: Draw the WBS in organization chart format or as an indented list.

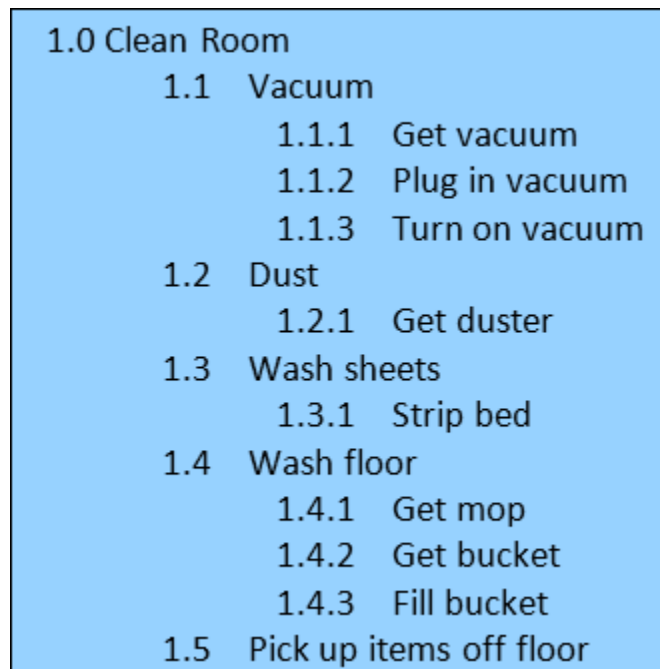
There are several ways to create and represent work breakdown structures. There are three different types of structures you can create: deliverable-based, activity-based, or mixed deliverable/activity-based. There are also two different formats for displaying your WBS. The type you use depends on your preferred style and project.

Types of Work Breakdown Structure Diagrams

Deliverable-based work breakdown structures list events and milestones. The events are listed using nouns, like the diagram below.



Activity-based work breakdown structures give specific activities that must be carried out. The activities listed typically begin with verbs, like the diagram below.



It is possible to mesh deliverable and activity-based **work breakdown structures** together to create a **deliverable/activity-based WBS**. In this instance, some levels of the hierarchy could start with nouns, while others could start with verbs, like the diagram below.

- 1.0 Clean Room
 - 1.1 Room is vacuumed
 - 1.1.1 Get vacuum
 - 1.1.2 Plug in vacuum
 - 1.1.3 Turn on vacuum
 - 1.2 Room is dusted
 - 1.2.1 Get duster
 - 1.3 Sheets are washed
 - 1.3.1 Strip bed
 - 1.4 Floor is washed
 - 1.4.1 Get mop
 - 1.4.2 Get bucket
 - 1.4.3 Fill bucket
 - 1.5 Floor is free from debris

Work Breakdown Structure Formats

You can use any combination of the formats below to create your work breakdown structure. Choose the best format for your project and organization and stick with it for the duration of the project.

Indented List

Level 1	Level 2	Level 3
Project	Task 1	
		Work Package
		Work Package
		Work Package
	Task 2	
		Work Package
		Work Package
	Work Package	

Spreadsheet

Work Breakdown Structure										
Project							Project #			
Project manager							Sponsor			
Project artifacts							Updated			
		Dependencies	Status	Effort Hours	Cost	Start Date	Planned Completion	Estimate to Completion	Actual Completion	Resource
1		ID # of task								
2										
3										
4										
5										
6										
7										
8										
9										
10										

Organizational Chart



Work Breakdown Structure Numbering

When creating a WBS, it is good form to number each level and milestone/activity. This will allow anyone involved with the project to refer to a specific task or event at any time.

The project itself is considered Level 1. As you subdivide events, each division creates another level of depth to the structure. As you describe and break out project components in more detail, you are creating levels 2, 3, 4, and so on.

There is no required or standard number of levels in a WBS; the only rule is to go down as far as necessary to reach your desired measurement unit or until you cannot subdivide any further. The table below shows standard numbering for a work breakdown structure.

Level 1	Level 2	Level 3
1.0 Project	1.1 Task 1	
		1.1.1 Work Package
		1.1.2 Work Package
		1.1.3 Work Package
	1.2 Task 2	
		1.2.1 Work Package
		1.2.2 Work Package
	1.3 Work Package	

Work Breakdown Structure Dictionary

A Work Breakdown Structure dictionary is sometimes helpful if the WBS content is not self-explanatory or is very complex. The level of detail in a WBS dictionary is basic, but it does provide more information for those stakeholders/team members who may not be aware of the finite details.

The WBS dictionary can take on whatever format you like, from a formatted document to a compilation of completed templates. That being said, there are a few general rules that you should be aware of when creating a dictionary. The dictionary should:

- Identify the hierarchical relationship of the element
- State specifically what is involved with the task or activity
- List any pertinent technical documentation, assumptions, or factors considered
- List known resources or processes required

Below are a sample Work Breakdown Structure and Work Breakdown Structure dictionary. To create and complete a WBS Dictionary, follow the sample below, listing the activity number, activity name, and a description for what is involved with the task.

Work Breakdown Structure

1.0 Room is Clean
1.1 Room is vacuumed
1.2 Room is dusted
1.3 Sheets are washed
1.4 Floor is washed
1.5 Floor is free from debris

Work Breakdown Structure Dictionary

WBS Dictionary			
Project		Project #	
Project manager		Sponsor	
Project artifacts		Updated	
Activity Number	Activity Name	Description	
e.g. 1.3	Sheets are washed	Sheets are to be removed from bed, washed, dried and placed back on bed	

Work Breakdown Structure Exercise
 Create a WBS for taking a camping trip.

Level 1	Level 2	Level 3	Level 4

