Introduction to Project Managemant

This guide walks you through the phases of project management. It teaches you skills and concepts to use in any big project you'll encounter in school and in your future career. It also applies them to a model project of cleaning up a vacant lot, so you can see how these ideas play out in a real-world situation. In each section, you'll find example charts and lists that make a good starting point for designing forms to suit your preferences.

Use this guide as you work through the DiscoverE engineering challenge projects. Project Management fits well with the Engineering Design Process, and together they break any project, no matter how dauntingly huge, into manageable chunks.

The Basics of Project Management

All of us have engaged in some aspects of project management. In fact, you have probably been developing and managing projects in your everyday life for a long time now without realizing it. Each time you planned what clothes to pack for vacation, scheduled a time and place to get together with friends, prepared a presentation, or conducted a science experiment with a team, you were participating in various aspects of project management.

What is a project?

A project:

- Is temporary. It has a beginning and end.
- Creates a unique product, service, or result.

Projects are how we get important things done. Organizing a school dance, planning a party, and writing a paper are examples of projects.

A project is **not** a daily, weekly, or even monthly routine or activity such as brushing your teeth or weekly chores. These activities are called **ongoing operations**. And even though packing for a trip goes better if you approach it like a project manager, this guide is not about projects you do by yourself. It's about big projects with other people.

What Is Project Management?

Project Management is a short way to describe everything we have to do to successfully get from the beginning to the end of a project. It's how we carry out all the parts of a project so that its goal—a product, service, or result—is met within the constraints of time (the schedule), cost (the budget), and quality. In other words, project management ensures that the project was completed by the deadline and within budget and that it was done well.

Why learn about project management if you've actually been doing it anyway? The more you know about it, and the more you practice using the project management skill set, the better any project will turn out. You'll have the confidence to manage ever bigger, more complicated projects down the road. Right now you may feel pretty good about, say, teaming up with your brother to throw a birthday party for your cousin, but strong project management skills will help you organize a successful business conference with hundreds of attendees from all over the world.

Engineers rely on project management to keep their projects from going over budget, taking too long, or failing to meet all of their goals. It also keeps really complicated projects from getting too confusing.

Projects are built around goals and objectives. The **goals** are the purposes of the project, the general outcomes you want to achieve. **Objectives** are the specific and measurable outcomes that need to be achieved in order to fulfill project goals.

For example, if the project is producing a school dance, the main goal is for the dance to be really fun. Other goals might be to avoid exceeding the budget and have a more successful dance than last year. Objectives might include contracting with vendors that meet the budget line items for taking photos and providing party food; another objective might be selling more tickets than last year. These are outcomes that make reaching the goals possible.

Project roles and responsibilities

Let's define some of the various roles within a project.

The **project manager** oversees the project from beginning to end and communicates progress to the relevant people at regular intervals. The project manager makes sure that each of the project's tasks and steps is completed.

A **project stakeholder** is a person or an organization who is involved or has an interest in the project or its outcome; they literally have a stake in how the project turns out. Project stakeholders may include customers, clients, vendors, and, of course, project team members. The stakeholders for the school dance include the students organizing it and the ones attending, as well as the principal and teachers who are helping and chaperoning. Musicians or DJs, the vendors providing refreshments, school newspaper staff, and yearbook photographers are stakeholders. Parents, members of the local community, and school cleaning staff may also be stakeholders.

One key project stakeholder is the **project sponsor**. The project sponsor is the person who provides financial help and other needed resources, such as publicity.

Project **team members** are the people who work on a project and contribute to its success.

Project Management Processes

Any project, no matter the size or complexity, involves using specific skills, tools, and procedures to bring the project to successful completion. Project management can be divided into five processes:

1. Initiating
2. Planning
3. Executing
4. Monitoring and Controlling
5. Closing

These processes help the project manager and team members define, organize, and keep track of all the work that needs to be accomplished.

Project Management Processes

The **Initiating** process is the beginning of the project. It covers the first steps such as coming up with an idea for a project, researching it, and making sure it has value. This phase also includes identifying stakeholders, choosing a manager and project team, and getting approval to make the project happen.

During the **Planning** process, the project manager and team members create the project plan. They define the activities, or scheduled portions of work performed during the course of a project, that are needed to complete the final product, service, or result, which can also be called a deliverable. The manager and team determine what constraints exist and what staff and resources are needed, including finances. They establish the timeline and choose milestones, or significant points at which certain steps should be completed. The planning process is very important to the overall success of the project. Without careful planning, a project manager and project team may find it very difficult to achieve success.

Executing is the process of working through the project plan. It's the doing phase. This stage involves performing the activities outlined during the planning process.

Monitoring and Controlling occur throughout the entire project. Monitoring and controlling ensure that all the tasks in the project plan are completed on time and within budget. It's also the process that reveals when changes may be necessary. No matter how carefully a project is planned, changes often need to be made to keep making progress. It's just a normal part of project implementation.

The **Closing** process marks the formal end of the project. The goals of the project have been met and deliverables have been handed over. Final administrative work is completed and lessons learned are captured to improve future projects. The closing process also involves taking the time to celebrate the team's successes along the way toward the completion of the project.

You'll learn more about these processes in the rest of this guide.

The Initiating Process

First steps

The initiating process has two goals:

1. Define the project
2. Identify stakeholders

Defining the project: Basic questions

When beginning a project, the first task is to define the project's goals. This is an opportunity to decide what will be done and what the expected deliverable, or deliverables, will be. A **deliverable** is the outcome or result of a project. If the project is putting out the yearbook, then the deliverable is the yearbook. Usually, a project results in more than one deliverable; project plans and progress reports are examples of others.

Once the purpose and deliverables are chosen, the project's scope becomes clear enough to put in writing. What will and will not be accomplished defines the scope. It also prevents scope creep, which happens when the original scope expands into a project that can no longer be accomplished within the constraints.

Defining the project includes listing the resources required, or everything needed to complete a project.

The following six foundational questions help teams best define their project.

- **Why?** Why is the project being initiated? What is the reason for the project?
- **Who?** Who is this work being done for? Identify the people participating in or affected by the project's outcome. These are the stakeholders.
- **What?** What are we going to deliver? What work do we need to complete? What resources and funds do we need to produce these deliverables?
- **When?** When will we produce these deliverables? When will the project sponsor approve and accept the final project deliverable?
- **Where?** Where will the deliverables be used? Where will this be accomplished?
- **How?** How are we going to achieve the project's goal and objectives? How will success be measured?

Introducing a Model Project: Vacant Lot Cleanup

Open High School in Richmond, VA, is located a few blocks from the James River. On their way to and from school, some students noticed a large vacant lot next to the river, overgrown with weeds and brush. The lot is strewn with trash and construction debris. Some of this garbage gets blown into the river. It's an eyesore and a pollution hazard. The students decided to take on the project of cleaning up the lot. They also wanted to plant native grasses and shrubs, which will prevent weeds from growing right back as well as provide food and shelter for the wildlife along the river.

They learned that the vacant lot is owned by the city of Richmond. They approached the city and a community organization— Friends of the James River Park—to help sponsor the improvement of the vacant lot. Both the city and the organization agreed that the project is a great idea. They have offered to act as advisors and provide some funding.

Throughout this guide, we will follow the Vacant Lot Cleanup project and how they used the Project Management processes to meet the goals of their project.

Answers to the Six Foundational Questions for the Vacant Lot Cleanup Project

1. Why?

The garbage and debris in the lot pollute the James River and pile up on the shores of the islands in the middle of the river, where there is a great blue heron rookery and other wildlife. The purpose of the project is to clean up the lot and prevent weeds from building up again by planting native plants, which will also support local wildlife.

2. Who?

- *Cleaning up this lot will benefit the citizens living and working nearby, including the families of some of the students at our school.*
- *The volunteer organization Friends of the James River is helping us because they work on making the James River healthy. They are happy we are taking on this project!*
- *The wildlife that depend on the river and the islands in it are stakeholders in a way because they suffer from the pollution.*

3. What?

The main deliverable will be a clean lot that is planted with native grasses and shrubs. Other deliverables include a project plan, a project report, a video of ourselves completing the project, photos for social media, and a presentation.

The work we need to complete:

Safely remove all of the garbage and weeds from the lot. We will compost what we can, recycle what we can, and donate metal scraps and any other materials we find that can be upcycled. We need to prepare the soil and plant native grass seeds and shrub starts.

Resources and funds:

Guidance from Friends of the James River and the City of Richmond
Guidance from teachers and parents
Guidance from local native plant nursery

Funds needed for:

- *safety equipment like gloves and goggles*
- *garbage containers, preferably not made out of single-use plastic*
- *means of taking garbage and debris to recycling and upcycling centers as well as the landfill*
- *tools for prepping the soil*
- *native grass seeds and shrub starts*
- *audiovisual editing software; computers for typing up reports*

4. When? *We will complete this project over spring break, April 2-April 9.*

5. Where? *The clean vacant lot planted with native plants is the deliverable.*

6. How?

In November, our team and a teacher will visit the lot and take photographs so we know what kinds of garbage and debris we will need to get rid of.

We will hold planning meetings with representatives of Friends of the James River, the city coordinator, parents and teachers who have signed up to help us, and our team.

We will visit the site with a representative from the native plant nursery that is involved in restoring habitat to decide what to plant.

Success will be measured by:

- *Photographs of the lot, before and after*
- *How much material we could keep out of the landfill*

Constraints

Every project has constraints. These are boundaries or restrictions that the project has to stay within. Time is usually a constraint, as is budget.

The team working on the Vacant Lot Project came up with these constraints:

- *We have to complete this project by April 15th.*
- *We have $1,000 to work with, although this is a preliminary estimate. The amount will be more specifically determined once we know what kinds of garbage need to be removed and what the city charges for each type of waste. We will ask for financial help from Friends of the James River as well as our school community.*
- *We need adult supervision when handling hazardous waste.*
- *All team members must wear protective gloves, long sleeves, and pants when clearing out the lot.*

Acceptance Criteria

Projects also have acceptance criteria. Project stakeholders and sponsors use them to ensure that each deliverable is completed with thought and care. They describe what success looks like for a particular project.

Here are the acceptance criteria for the Vacant Lot Project:

- *The project plan specifies how we will dispose of each type of garbage and debris, including recycling and upcycling.*
- *The project plan lists the native plants we will plant and includes information about how Friends of the James River will continue weeding and maintaining the native plants once the project is complete.*
- *Photos and video provide a complete picture of what the lot looked like before and after we completed the project.*
- *The project report includes specifics on how much of each kind of garbage and debris we collected. It will also describe what sorts of weeds we removed.*
- *The project report lists the native plants we planted.*

Identify Stakeholders

Remember that **stakeholders** are the people or organizations that have an interest in the project or the project's outcome.

In the initiating process, project teams will often create a **stakeholder register**, which includes the individuals involved and/or impacted by the project, their role in the project (customer, sponsor, team member, or public), and their contact information.

Stakeholder Register Project Title: Vacant Lot Cleanup

Name	Role in Project	Contact Information
Ms. Davis	Teacher Advisor	fdavis@openschool.edu
Lee Harris	Community Outreach Coordinator, City of Richmond	harris.lee@richmondgov.com
Jamal Jackson	Project Manager	757-555-2398
Minh Nyugen	Assistant Project Manager	804-555-3409

The Planning Process

Without careful planning, a project manager and project team may find it difficult to achieve project success.

The **planning process** includes the following actions:

- Writing a scope statement
- Planning how to monitor and control the project
- Building a project schedule
- Assigning roles and responsibilities
- Planning for acquiring resources
- Creating a budget
- Planning how and when to communicate
- Planning for risk

Writing a scope statement

The **scope statement** builds upon the work of the initiating process and gets more specific. It describes the work that will be done and what will not be done to create the project's unique outcome.

An example of a scope statement for the Vacant Lot Project:

The project will include:

- *removing debris, garbage, and weeds*
- *recycling as many of the materials collected as possible*
- *planting native grass and shrub seedlings*

The project will NOT include:

- *choosing a use for the lot*

Planning when and how to monitor and control the project

Each part of the planning process builds on the others. You may find that you need to revisit and revise parts of your project along the way. This process of review and revision is part of monitoring and controlling your project. Monitoring and controlling will be easier to conduct with ongoing check-ins.

Take the time to plan how frequently you will schedule check-ins with your team and project sponsor and how you will document the progress you're making. Depending on the size and complexity of your project, you may decide to check in hourly, daily, or weekly.

We will discuss the monitoring and controlling process in more detail in the next section.

Building a Project Schedule

A **project schedule** identifies the milestones, activities, and tasks to be completed and gives each one a start date and a due date.

To create a schedule, follow these steps.

1. **Identify milestones**: Milestones are the critical points in a project's timeline that can be monitored to determine if the project is on schedule. They show the completion of major pieces of the project.

Helpful Hints:

- ◊ Break down the work

  Use sticky notes to identify your milestones, activities, and tasks.

- ◊ Create your schedule

  Arranging the sticky notes in the order they should be done will help create your schedule.

- ◊ Identify dependent tasks to help put tasks in a logical sequence

  Ask yourself, which tasks need another task to be completed first, before they can start?

2. **Define activities**: What activities need to be accomplished to meet each milestone?

3. **List tasks**: Tasks are the "to-do" list for each activity.

4. **Determine the sequence**: When will each milestone, activity, and task be accomplished?

To determine the sequence, you will need to assess which activities and tasks are dependent and which are independent.

A **dependent** task means that another activity or task must be complete before the dependent task can begin.

> *Example: If I'm going to bring bottles to the recycling center, the team has to collect them from the vacant lot first. So, the recycling center trip is dependent on the bottles being collected and put in containers.*

An **independent** task means the activity or task can be completed at any time and is not related to some other task being completed. Some projects have very few of this type.

5. **Estimate time**: How long will each task take to be completed? This is your best guess based on past experience, considering the amount of work to be done.

   Underestimating the amount of time needed to complete each activity is a common error. Building extra time into the schedule offsets this tendency and helps you meet each deadline.

6. **Build the schedule**: With all of the above information in hand, it is now possible to build the schedule.

Schedule Project Title: Vacant Lot Cleanup

Task	Estimate Work Time	March 30		April 1		April 2		April 3		April 4	
Collecting tools	1 day	X	X								
Hold final planning meeting	4 hours				X						
Get set up on site	1 day					X	X				
Clean up and sort debris	3 days							X	X	X	X

Assigning Roles and Responsibilities

Think about what each team member's strengths and preferences are as you assign responsibilities. You can use a **Responsibility Assignments** form to assign team members to appropriate tasks. It's also a good idea to assign a backup person in case the primary person is unavailable.

Responsibility Assignments Project Title: Vacant Lot Cleanup

	Person					
Activity	Jamal	Kim	David	Minh	Sam	Aisha
Setup crew for Saturday	X	X			X	
Photographer and videographer for Saturday			X	X		
Main cleanup crew	X	X	X	X	X	X
Recycling hauling					X	X

Planning for acquiring resources

Resource planning means considering all the things needed to complete the project. This may include people, money, equipment, or even space needed to do the work.

In the planning process, you will need to determine **where** and **how** you will acquire each resource, **when** each resource is needed, and **how long** you will need it for.

Plan for Acquiring Resources Project Title: Vacant Lot Cleanup

Resource Needed	When will you need it?	How you will acquire it
10 pairs of work gloves	March 30	Buy during sale the week of February 20 at HomeGoods Hardware Store
8 large bins to sort recycling	April 2	To be delivered on-site by Richmond Sanitation
1 large dumpster for trash	April 2	To be delivered on-site by Richmond Sanitation
120 lbs of native grass seed	April 5	Donated and delivered by Virginia Natives Nursery

Creating a Budget

A **budget** is the estimated amount the project will cost, including labor, supplies, and overhead (office space and equipment). The budget for each project depends on the specific needs of the project. The Vacant Lot Project may not need office space, for example. The **line items** in a budget identify each separate cost. Every row in the budget is a line item. Add the estimates to determine the total cost of the project.

Create a Budget Project Title: Vacant Lot Cleanup

Activity	Supplies Cost	Other Resources Cost
Picking up debris	work gloves x 10 = $90 boxes of garbage bags x 5 = $60	
Storing and transporting debris		dumpster rental = $300
City Council Presentation	extra large posterboard x 2 =$24 photo prints x 6 = $30	
Planting native shrubs	shrub starts x 50 = $750	

Planning When, What, and How to Communicate

Team members and stakeholders need information on how the project is developing and what may need to change to get all of the work done.

Planning for communication involves having a clear understanding of who needs to communicate with whom and how often, as well as what information would be relevant and useful to each stakeholder.

Communication Plan Project Title: Vacant Lot Cleanup

Who to contact	What to communicate	How? (Method)	When?
Alisha	Who will be on the Saturday cleanup crew	Group text	By 6 pm on March 30th
Richmond Sanitation	When the dumpster is ready to be picked up	Phone call	When debris collection is complete
Minh	Suggestions for photos to take on-site	In person	At the final planning meeting and on-site
Jamal	If you get sick and need someone to take your place for any activity	Text message	any time

Planning for Risk

Things can go wrong in any project. Identifying potential risks in advance gives you a chance to plan a response to avoid or minimize those risks.

Risks could impact one or more aspects of the project, including:

- Resources: Ability to acquire people, equipment, funding, or other resources to complete project
- Timing: Completing deliverables or the entire project on schedule
- Scope: Completing and delivering all the items named in the scope statement
- Quality: Meeting the acceptance criteria for each deliverable

Managing Project Risk

Project Title: Vacant Lot Cleanup

What might go wrong?	Risk Level L = Low M = Medium H = High	Area of Impact R = Resources T = Timing S = Scope Q = Quality	How to prevent it or fix it
Not enough tools (rakes and shovels) for cleanup	H	R	We need to put an announcement on the school website and reach out to Friends of James River Park for assistance.
Team members showing up late on cleanup days	L	R	Send a group reminder each evening to have everyone set an alarm for 8 am in the morning
Native shrubs will not be planted properly to thrive	M	Q	Set up a training with Fred from Virginia Natives Nursery on how to plant a shrub
We might exceed our budget	M	R	Check with Friends of James River Park if extra funding is available. Otherwise, cut back order on number of shrubs.

Helpful Hints:

Work through the following steps to reduce or eliminate the negative impact of risk:

- ◊ Identify any risks associated with the completion of the project
- ◊ Estimate the severity level of each risk
- ◊ Determine the areas each possible risk will affect
- ◊ Create a strategy to address the potential risk(s)

The Executing Process

Putting your plan in motion

Executing is the process of putting your plan into action. The project plan serves as a guide to help ensure that the deliverables will be completed properly, on time, and within the budget.

As work is being executed, the documents you put together in the planning process will keep you on track:

- Use your budget and resources as planned.
- Keep an eye out for the risks you identified.
- Stay focused only on the work you described in your project's scope statement.
- Meet your milestones.
- Document your progress in an organized way.
- Communicate your project's progress regularly and effectively to your stakeholders.

By checking on your progress, evaluating whether project goals are being achieved in the best possible way, and being prepared to adjust their path if necessary, you are engaged in the monitoring/controlling process.

The Monitoring and Controlling Process

Keeping everything on the right track

Monitoring/controlling is a continuous process throughout the project life cycle.

Project managers and team members need to establish a cycle to evaluate the progress of the project and report back to stakeholders about project developments.

Controlling scope is a key component of the monitoring/controlling process.

Monitoring and controlling:

- Ensures that all of the tasks necessary to achieve the project goals are completed.
- Identifies any activities that need to be added to the project or revised.
- Prevents work on the project from going beyond the scope.
- Determines what to do if any activity is taking more time than planned.

Scope creep occurs when work is added to the project without appropriately adjusting the schedule and resources and without obtaining sponsor approval.

One way to prevent scope creep is to routinely review the acceptance criteria established during the initiation process. Reviewing them is also important to make sure that the deliverables satisfy project stakeholders and meet their standards.

Adjusting for the unexpected

It is more than likely that you will encounter some surprises as the project progresses. That's okay — that's what monitoring/controlling is for. Discuss any surprises that occur as project work is being done. If a change needs to occur, review the schedule, resources, and scope to see if there are other changes that need to be made.

Helpful Hints:

- Avoiding scope creep starts early.

  During the initiating process, you established a goal, which started to set the boundaries for the project's work and scope.

- Planning for scope creep.

  During the planning process, you took another step and established what would not be included or would be "out of scope" for the project.

- Hard work pays off.

  You have already done work to establish what is and what is not a part of the project's scope. Now, you can rely on and monitor those plans to help you avoid scope creep.

Status Reports

A status report is an effective way to monitor and document the progress of your project and communicate that progress to others. Each **status report** should include:

- What work has been completed
- What tasks are in progress
- What work is still planned
- What issues have developed

Status reports can help identify items that might affect the project scope, timeline, budget, or deliverables. For example, if the project is cleaning up a vacant lot, but a hazardous substance was discovered that requires an expert to remove, then the timeline for completing the project will need to change.

On the next page, you will find an example of a status report for the vacant lot cleanup project.

Project Status Report Project Title: Vacant Lot Cleanup

Team Name: Cleanup Crew

Date: March 30

Project Status:

- [x] In good shape
- [ ] At risk of going off track
- [ ] Out of control

Tasks Accomplished:
What work have you completed?

- We've purchased work gloves and trash bags
- We've arranged for recycling bins and a trash dumpster
- We've arranged for the donation of 120 lbs of native grass seed

Tasks in Progress:
What are you currently working on?

-We're still working to borrow enough rakes and shovels
-We're trying to arrange for the Richmond Gazette to visit during the project work

Planned Tasks:

What work do you still need to start?

- Planning our presentation to the Richmond City Council to show them the work and results of our project

Issues:
What challenges have you experienced? What steps did you (or will you) take to solve them?

- We're having some challenges finding enough tools to borrow
- We put an announcement on the school website and reached out to Friends of James River Park for assistance

Questions for Discussion:

What do you need to talk with your project manager about?

- What will we do if we can't gather enough tools by April 2nd?

The Closing Process

Final steps

Closing is the process of completing the project.

Finishing a project is an accomplishment. It's the achievement of a lot of work. As a group, you and your team members collectively sparked an idea, planned it, executed the plan, monitored/controlled your progress, delivered, and have now reached the closing process.

In the closing process, you have the opportunity to reflect upon the quality of the project deliverables, what you learned about managing a project, and how well you and your team worked together.

In the closing process, there is still some work to be completed:

1. A closing **presentation** is created for some projects to present the final report to the stakeholders.

2. Collection and storage of any project-related paperwork and documents (such as the project plan, completed schedule, etc.) in a **project portfolio** such as in a notebook or a computer. These documents become reference material for future projects.

3. Team members need to **sign off** on the project to verify that the project is completed.

4. Create a **lessons learned** report with team members by asking what went well, what could have been done better, and what should continue.

5. Complete a **self- and peer assessment**. Include whether you and your group:
   - Treated each other with respect
   - Shared responsibilities
   - Communicated clearly and effectively
   - Organized project tasks and timelines well
   - Managed time wisely

6. Finally, **celebrate** all that you and your team have accomplished! Regardless of the outcome, you've dedicated time and effort, learned a lot along the way, and should be rewarded for such effort.

On the next page, you will find an example of a lessons learned report for the Vacant Lot Cleanup project.

Lessons Learned

Project Title: Vacant Lot Cleanup

Team Name: Cleanup Crew

What did we do right?

- We made a clear plan and schedule that worked out well
- We found all of the resources we needed, many of them donated so that we kept within our budget
- We really transformed the lot from an ugly, trashed site to a clean, beautiful space

What could we have done better?

- Arranged further in advance to make sure we could borrow all of the tools we would need
- Take more photos and videos of the whole project process

What should we continue to do?

- Monitor the site to see if it gathers trash going forward
- Collaborate with Friends of James River Park on other cleanup projects

What significant issues did we encounter during the project, and how were these issues handled?

- We didn't have all of the tools (rakes and shovels) we needed by the time we began the cleanup. We found a way to share the tools we had to make things work good enough
- We had trouble agreeing which two team members would present our results to the Richmond City Council. We had our mentor talk it through with us and figure out who would be the best presenters

What lessons did we learn from this project that will help us when doing projects in the future?

- You can never do too much planning
- It's good to have some extra budget available for unexpected supply needs
- City government and non-profit organizations can be very helpful to get things done

Glossary of Project Management Terms

Acceptance criteria: A set of conditions that must be met before deliverables are accepted.

Activity: A distinct, scheduled portion of work performed during the course of a project to meet a project milestone.

Budget: The estimated amount the project will cost, including labor, supplies, and overhead (office space and equipment).

Closing process: The process(es) performed to formally complete or close a project.

Constraint: A limiting factor that affects the execution of a project, such as time or money.

Deliverable: What is delivered to the client as a result of the project. Deliverables can be products or completed activities; projects usually create deliverables during the project, such as progress reports, as well as the final deliverable.

Executing process: The doing phase of a project; work is completed until the project goals are achieved.

Goals: The main purposes of the project; the general outcomes you want to achieve.

Initiating process: The first steps of a project. These include coming up with a project idea, vetting it, identifying stakeholders, choosing the project manager and team, and getting the project authorized.

Milestone: A significant point or event in a project that marks progress toward the project's completion.

Monitoring/controlling process: The processes of tracking, reviewing, and regulating the progress and performance of the project. During this phase, any needed changes are identified, and the team prepares to make those changes.

Objectives: The specific and measurable outcomes that need to be achieved to fulfill project goals.

Planning process: The phase of a project set in motion after it has been approved, during which many key decisions are made. These include writing the scope statement, project schedule, and budget. It also includes deciding how to monitor the project's progress, who will do what, how to obtain resources, how and when to communicate with project stakeholders, and thinking ahead about handling potential risks and pitfalls.

Project: A temporary endeavor undertaken to create a unique product, service, or result that has value to people.

Glossary of Project Management Terms (continued)

Project management: The use of specific knowledge, tools, and techniques to ensure that a project comes to successful fruition.

Project manager: The person chosen to lead the team who is responsible for completing the project.

Project portfolio: A collection of all the documents generated over the course of a project.

Project schedule: A detailed layout of a project's timeline that provides a start date and a due date for all project milestones, activities, and tasks.

Project scope: Description of the project's limits in terms of its cost, time frame, and objectives.

Project team: A set of individuals who support the project manager in performing the work of the project to achieve its objectives.

Resource: Anything needed to complete the project—people, tools, money, time, and facilities, for example.

Risk: A potential event or condition that can have a negative effect on the project.

Scope creep: The uncontrolled expansion of the project scope without adjustments to time, cost, and resources; when goals get added that weren't part of the original scope.

Scope statement: The formal description of a project's scope. The scope statement describes the work that will be done as well as what won't be done to create the project's unique outcome.

Sign off: Approve or agree with a decision.

Sponsor: A person or group who provides resources and support for the project. A project sponsor is responsible for enabling success.

Stakeholder: A person, group, or organization that has something to gain or lose from a project's outcome; anyone with an interest or investment in a project.

Stakeholder register: A project document that lists project stakeholders and relevant information about them.

Status report: The document that details progress toward completion of the project.

Task: The discrete steps that must be accomplished to complete a project activity. **Dependent tasks** are steps that can only be taken if the previous steps are done; **independent tasks** are not contingent on other tasks and can be done within a more flexible time frame.

Appendix of Project Management Templates

Templates are a type of tool that give you a basic layout for creating your own versions of documents. You may use the templates in this Appendix to guide your Project Management Processes. Either print the PDFs in this appendix or download editable Word documents at this URL: discovere.org/stem-activities/introduction-to-project-management/

Initiating Process

- Stakeholder Register

Planning Process

- Project Schedule
- Responsibility Assignments
- Plan for Acquiring Resources
- Create a Budget
- Communication Plan
- Managing Project Risk

Executing Process

no templates necessary

Monitoring and Controlling Process

- Status Report

Closing Process

- Lessons Learned

Stakeholder Register Project Title: _____

Name	Role in Project	Contact Information

Schedule

Project Title: _____

Task	Estimate Work Time										

Responsibility Assignments

Project Title: _____

	Person				
Activity					

Plan for Acquiring Resources Project Title: _____

Resource Needed	When will you need it?	How you will acquire it

Create a Budget

Project Title: _____

Estimate the cost of supplies and other resources for each activity.

Activity	Supplies Cost	Other Resources Cost

Communication Plan

Project Title: _____

Who to contact	What to communicate	How? (Method)	When?

Managing Project Risk

Project Title: _____

What might go wrong?	Risk Level L = Low M = Medium H = High	Area of Impact R = Resources T = Timing S = Scope Q = Quality	How to prevent it or fix it

Project Status Report Project Title_____

Team Name:

Date:

Project Status:

- ☐ In good shape
- ☐ At risk of going off track
- ☐ Out of control

Tasks Accomplished:
What work have you completed?

Tasks in Progress:
What are you currently working on?

Planned Tasks:
What work do you still need to start?

Issues:
What challenges have you experienced? What steps did you (or will you) take to solve them?

Questions for Discussion:
What do you need to talk with your project manager about?

Lessons Learned

Project Title_____

Team Name:

What did we do right?

What could we have done better?

What should we continue to do?

What significant issues did we encounter during the project, and how were these issues handled?

What lessons did we learn from this project that will help us when doing projects in the future?