

# The Unit 4 extra credit pack

*Nine items you can do on your own time, in any order, for real points*

Unit 4 has eleven pieces of PLTW material and seven class days. Two of those pieces are taught in class. The other nine are in this pack. They are not the leftovers. Several of them are better than what fits on the calendar, and one of them is the best thing in the whole course.

OPENS AFTER UNIT 2

SELF-PACED

SUBMIT ANY DAY

CAPPED AT 20 POINTS PER SEMESTER

## What extra credit is here, and what it is not

Extra credit in this class is real points on a real gradebook, announced with its value, open to every student. It is not a favour and you do not have to ask for it.

### THE RULES, STRAIGHT FROM THE GRADING POLICY

- Extra credit is **capped at 20 points per semester**. The course is 1,000 points, so 20 points is two percent of your grade. Two percent moves a borderline letter. It does not rescue a semester and nothing in this pack pretends otherwise.
- It is **open to every student**. Not a reward for the fastest, not a consolation for the furthest behind.
- It is available to students who are **turning in their Friday reflections**, because the reflection is how we both know where you actually stand.
- It is **on top of class work, not instead of it**. Extra credit cannot replace a missing assignment. If you have missing work, do that first. It is worth more.

### WHEN IT OPENS AND HOW LONG IT STAYS OPEN

The pack opens once the class finishes **Unit 2**. You will know it is open when an Extra Credit section appears at the bottom of your daily lesson pages and the pack shows up on the portal. From that moment it stays open until the last week of the semester. There is no deadline inside that window. Do one item in October and another in December if that is how your life works.

## What each item is worth

Every item has its point value printed on its own front page and in its own footer. The value is set by what the work costs you. It is not set by whether the state exam happens to measure it. Those are two different questions and the table further down this page keeps them apart on purpose.

| POINTS | WHAT SITS AT THAT VALUE                                                                                                                                          | WHICH ITEMS                                                           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 5      | One work session, roughly 60 to 90 minutes, ending in something written or built. Inside this band the numbers do not get split over fifteen minutes either way. | Activities 4.1.2 Device Lab, 4.1.1 Open for Innovation, 4.2.1 Mapping |

| POINTS | WHAT SITS AT THAT VALUE                                                                                                                                                                                                                                                | WHICH ITEMS                                                          |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
|        |                                                                                                                                                                                                                                                                        | Innovation, 4.2.3 Out of This World, and 4.1.4 Health Promotion      |
| 7      | About two hours, usually across two sittings, ending in a designed product and a pitch.                                                                                                                                                                                | Project 4.1.6 Innovation by Inspiration, Project 4.2.4 New Frontiers |
| 8      | The only wet lab in the pack. Two supervised sessions booked 24 hours apart, real chemical and sharps handling, and a control you design and get approved before you are allowed to carry on. Paid above the two hour items because it costs you more than bench time. | Activity 4.1.3 Regenerative Medicine                                 |
| 10     | Four to five hours across several sittings, twelve deliverables, and the largest single piece of work in the course.                                                                                                                                                   | Problem 4.3.1 Pioneering the Future                                  |

#### WHAT 20 POINTS ACTUALLY BUYS

- **No single item fills the cap.** The largest is 10, which is half of it.
- **No two items fill it either.** The two largest are 10 and 8, and that is 18. Reaching 20 always takes at least three items.
- **Three combinations land on exactly 20.** Five plus five plus ten. Five plus seven plus eight. Or four fives. Every one of those is three or four items.
- **Past 20 the extra is not credited.** Five items is always too many, because the five cheapest items are 5 points each and that is 25. Do the arithmetic before you start a fifth one, so you are not giving away work for nothing.

#### THE PART THAT IS NOT PROPORTIONAL, AND WHY IT IS NOT

Short items pay better per hour than long ones. Mapping Innovation is about an hour for 5 points. Pioneering the Future is four to five hours for 10. That gap is deliberate and the cap is the whole reason for it.

At Mapping Innovation's rate, Pioneering the Future would come out at 20 to 25 points on its own, which is a single item worth your entire semester of extra credit or more. An item priced above the cap is a lie, because the cap would quietly swallow the difference and you would only find out after you had done the work. So the long items are priced at what they can actually pay, and it is written here rather than left for you to discover.

## The honest note about the exam

PBS is assessed by WebXam under Ohio course code **072110**. That exam has exactly two weighted domains, and both of them are about laboratory practice:

| DOMAIN                                      | SHARE OF THE EXAM |
|---------------------------------------------|-------------------|
| Handling, Preparation, Storage and Disposal | 53.93 percent     |
| Biotechnology Research and Experiments      | 46.07 percent     |

Nothing else is weighted. That is a blunt fact and it decides which of these nine items help you on the exam and which do not. Here is the whole pack sorted by that answer, with nothing smoothed over.

| # | ITEM                                    | POINTS | HANDS ON? | DOES IT HELP ON THE WEBXAM?                                                                                                                                                                                                                                                               |
|---|-----------------------------------------|--------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Activity 4.1.3 Regenerative Medicine    | 8      | Yes       | <b>Yes, the most of anything in this pack.</b> Detergent handling, PPE, a scalpel, waste disposal, and a control you design yourself. It feeds the 53.93 percent domain directly. It is off the class calendar only because its 24 hour incubation costs a day the calendar cannot spare. |
| 2 | Activity 4.1.2 Device Lab               | 5      | Yes       | <b>Yes.</b> Building a model to a numeric specification and verifying it against a partner's is measurement and tolerance practice. It feeds the 46.07 percent domain. No bench handling.                                                                                                 |
| 3 | Activity 4.1.1 Open for Innovation      | 5      | Yes       | <b>Somewhat.</b> A timed build and test cycle against stated criteria. It touches experimental thinking, but nothing in it is measured quantitatively.                                                                                                                                    |
| 4 | Activity 4.2.1 Mapping Innovation       | 5      | No        | <b>No.</b> Filtering a geographic dataset against numeric criteria. Genuinely good data literacy work. No bench, no experiment, no weighted domain.                                                                                                                                       |
| 5 | Activity 4.2.3 Out of This World        | 5      | No        | <b>No.</b> Reading trends across several clinical data streams and sketching design responses. Analysis and design, not method.                                                                                                                                                           |
| 6 | Activity 4.1.4 Health Promotion         | 5      | No        | <b>No.</b> Program design and a pitch. No laboratory or experimental component at all.                                                                                                                                                                                                    |
| 7 | Project 4.1.6 Innovation by Inspiration | 7      | No        | <b>No.</b> Biomimicry design with a decision matrix. PLTW states plainly that no prototype is built and tests are only proposed.                                                                                                                                                          |
| 8 | Project 4.2.4 New Frontiers             | 7      | No        | <b>No.</b> A research and presentation product. Strong communication work, no method.                                                                                                                                                                                                     |
| 9 | Problem 4.3.1 Pioneering the Future     | 10     | No        | <b>No.</b> And you should probably still do it. See the box below.                                                                                                                                                                                                                        |

### ABOUT NUMBER NINE, WHICH IS THE INTERESTING CASE

Problem 4.3.1 Pioneering the Future is the PBS course capstone and the best synthesis task in the whole year. You define your own problem, write your own criteria and constraints, choose a solution with a decision matrix, design the lab space, and write the testing and evaluation plans. It is the closest thing in this course to what the work actually is.

It also writes a testing plan and an evaluation plan and then **executes neither**, which is why it feeds no weighted domain and will not help you on the WebXam. Both things are true at once. It is the highest paid item in this pack at 10 points and it helps you least on the exam, and both of those are deliberate. Effort gets paid here whether or not a state test happens to measure it. If the point values said anything else, this pack would be quietly paying for exam relevance while telling you it does not.

Notice that the number is large and the pull is weak, which is the shape it should be. Ten points for four to five hours is the worst rate in the pack by a distance. Nobody working the numbers starts here. Anyone who starts here picked it.

If your goal this semester is the exam score, start at number one. If your goal is to find out whether you want to do this for a living, start at number nine.

---

## How to use the pack

- 1 **Pick by what you want, not by what is next.** The numbering is a ranking by exam value, not an order you have to follow. Nothing here depends on anything else here.
- 2 **Read the whole item printable before you start.** Each one tells you how long it takes and what you need before you begin. Two of them need materials you have to arrange in advance, and one of them needs a 24 hour gap in the middle.
- 3 **Get the materials sorted first if it is a hands-on item.** For anything using school equipment or chemicals, see Mr. Mendoza before the day you plan to work. Do not turn up expecting a bench to be free.
- 4 **Do the work and write it down as you go.** Every item names exactly what finished looks like, with a worked example of the format.
- 5 **Submit.** Class form on the portal, or hand it to Mr. Mendoza.

---

## Ground rules

- **Nothing hands-on happens without permission and supervision.** Every wet lab item in this pack is done at school, in the lab, with Mr. Mendoza present. Not at a kitchen table. Not at a friend's house. The chemistry is real and so is the equipment.
- **Work with someone if you want to.** Most of these are better with a partner. Say who you worked with on your submission. Both of you write your own pages.
- **Do not copy a classmate's numbers.** Two people with identical data and no shared bench is the easiest thing in the world to spot, and it turns extra credit into an academic integrity conversation.
- **An honest failure earns credit.** An experiment that did not work, written up properly with what went wrong and what you would change, earns full points. A result you made up earns none.
- **Ask.** If a step in a printable does not make sense, that is worth telling me. These are written to be done without a teacher standing there, and where they fall short I want to fix them.

---

## How to submit and how it is credited

- **Where it goes.** The same place as everything else. Your class form on the portal, or handed to Mr. Mendoza in person. Nothing about extra credit needs a different route.
- **What to hand in.** Photographs of your work where the handout asks for them, plus your written pages. Photographs of handwritten pages are fine. A photograph you cannot read is not.
- **Put your name and period on every page and every photograph filename.** Unlabelled work cannot be credited and it is the single most common way points get lost.
- **When.** Any day after the pack opens, right up to the last week of the semester. There is no deadline inside that window and no penalty for going slowly.
- **Feedback.** You get it back with a note. If a piece is short of full credit you may fix the named thing and resubmit once.

#### WHAT EARNS FULL POINTS ON ANY ITEM IN THIS PACK

- Every part the printable asked for is present.
- The work is yours and the numbers are ones you actually got.
- Where the printable asked you to name something you are unsure about, you named it.
- It is readable. Legible handwriting or typed, photographs in focus and right way up.

#### GO HORNETS

The reason this pack exists is that the calendar is finite and Unit 4 is not. Nine good pieces of work were about to be thrown away because sixty class days will not hold seventy-something days of material. They are here instead. Take the ones you want.