Activity 3.1.5
Isolation

DATE	PORTAL DAY	LESSON	TURN IN
Wednesday 2026-11-24	**Outbreak data and agent ID lab**	**Lesson 3.1 Nosocomial Nightmare**	**Data table**

> **Where this sits.** Day 2 of 2. Your plates have been at 30 degrees Celsius for 48 hours. Today you read them without opening them.

01 Why today matters

Everything you can learn about a bacterium with your eyes alone gets recorded today, in a vocabulary precise enough that another lab could match your description without seeing your plate.

This is also the first day you compare your three patients against the eight the hospital lab ran, which is where a pattern either appears or does not.

02 What you already know

- You streaked three patient plates on Monday and inverted them at 30 degrees Celsius.
- You know a colony is millions of cells descended from one cell, so one colony type usually means one species.
- You know what a successful isolation streak is supposed to look like, because you drew one.

WHAT THIS SHEET WILL NOT TELL YOU

- This sheet does not carry the table that matches colony appearance to a species name. You get that in class, from your teacher, AFTER your own observations are written down and shown.
- It does not tell you what your plates should look like, and it does not tell you what the answer is.
- Record first. Match second. Doing it the other way round is how people see what they came to see.

03 Vocabulary

TERM	WHAT IT MEANS, PLAINLY
colony morphology	The set of visible features that describe how a colony looks: colour, form, elevation, and margin.
form	The overall outline of the colony seen from above.
circular	Form: a round colony with a smooth outline.
irregular	Form: an outline with no consistent shape.
filamentous	Form: thread-like, spreading out in fine strands.
rhizoid	Form: branching outward like roots.
elevation	How the colony sits above the agar, seen from the side. Turn the plate and look across it, do not look straight down.

flat	Elevation: level with the agar surface.
raised	Elevation: lifted above the surface with roughly straight sides.
convex	Elevation: domed, like a contact lens.
umbonate	Elevation: domed with a raised button in the middle.
crateriform	Elevation: sunken in the middle, like a small crater.
margin	The edge of the colony.
entire	Margin: a smooth unbroken edge.
undulate	Margin: a wavy edge.
filiform	Margin: an edge with fine thread-like projections.
curled	Margin: an edge that looks rolled inward.
lobate	Margin: an edge with rounded finger-like lobes.
pigment	A coloured substance some bacteria produce, which gives their colonies a colour other than cream or white.
culture key	A reference table that lists known species alongside the colony features they usually show. It narrows a field. It does not confirm an identity.

Every term on this list is flagged for the illustrated glossary, scoped to this activity only. Terms are not shared forward or backward between activities, because a definition from a later activity can hand you an answer you were supposed to derive.

04 How to do the work

1. Wash your hands. Goggles, gloves, coat. Disinfect the bench.
2. Take your three plates out of the incubator. Do not open them. Not once, not for a second, not to smell them.
3. Look at each plate against a light background and then against a dark one. Some colonies only show their colour against one of the two.
4. For each plate, first answer one question in your notebook: how many different species appear to be present, and what specifically makes you say that? Different colour, different shape, different edge, different size, growing in a different part of the plate.
5. Build your data table. One block per patient, one row per distinct colony type, with columns for colour, form, elevation, and margin. Use the vocabulary above. 'Roundish and kind of tan' is not data. 'Circular, convex, entire, cream' is.
6. Use a magnifying glass. Turn the plate on its side to judge elevation; you cannot see height from directly above.
7. Draw what you see with coloured pencils. Drawing forces you to notice the edge, and the edge is the feature people skip.
8. If your streak did not separate, say so honestly in your notebook and say what you think went wrong. Then get observations from another group's plates or your teacher's control plates so you have data to work with. A failed streak that you diagnosed correctly is worth more than a lucky one you cannot explain.
9. Answer the pattern question in writing: is there any one colony type that appears on more than one of your three plates? Describe it by its features. Do not name a species yet.
10. Now, and only now, ask your teacher for the culture key. Match your recorded observations against it and write down every species your observations are consistent with. Expect more than one. Expect some colonies that match nothing.

11 If a colony matches nothing on the key, do not force it. The key lists common causes of hospital infections; your plate also has normal flora on it, and normal flora is not on that list.

12 Compare your three patients to the results the hospital lab obtained for the other eight patients. Read across all eleven and write down what you notice.

13 Write your conclusion: what are the possible identities of the organism causing the outbreak, and what specifically supports each possibility? Then write what you still cannot rule out and what test would rule it out.

14 Follow your teacher's instructions for storing the plates. You need them intact tomorrow.

15 Disinfect the bench, gloves off inside out into hazardous waste, wash your hands.

05 Safety

READ EVERY LINE BEFORE YOU START

- Splash goggles, gloves, and a lab coat or apron go on before anything comes out of the cupboard, and they stay on until the bench is wiped down. Tie long hair back.
- Wash your hands with soap and warm water, then wipe the whole bench with disinfectant and let it sit wet for the time your teacher gives you. A wipe that dries in two seconds did not disinfect anything.
- The plates stay closed all period. There is nothing you can learn by opening one today that you cannot learn through the lid, and opening it puts room air on your culture and your culture in the room air.
- Never smell a plate. It is a real technique in some professional labs and it is not one you use here.
- You are handling living bacteria. Nothing in the kit is meant to make you sick, but treat every plate, loop, and slide as if it could. Nothing goes near your face. No food, no drink, no gum, no vape, no phone on the bench.
- Wipe the bench with disinfectant again at the end. Peel your gloves off inside out without touching the outside, drop them in the hazardous waste container, and wash your hands last. Gloves are the dirtiest thing you touched all period.

06 Where students get stuck

- Recording one line per plate instead of one line per colony type. A plate usually has more than one species on it. That is the entire reason you did an isolation streak.
- Judging elevation from above. Flat, raised, convex, umbonate, and crateriform are all the same circle when you look straight down. Turn the plate.
- Calling two colonies the same species because they are the same colour. Colour is one of four features and it is the least reliable, because it changes with the light, the background, and how old the culture is. Check form, elevation, and margin too.
- Looking at the key first. Once you have read the key, your eyes will find what is on it. Write your observations, show them, then match.
- Forcing every colony onto the key. Some of what grew is normal flora. The key lists organisms that commonly cause hospital infections, which is a short and deliberately incomplete list.
- Treating a match as an identification. Colony morphology narrows the field. It cannot finish the job, because there are far more bacterial species than there are combinations of colour, form, elevation, and margin. That is why there is a lab tomorrow.

07 What you turn in

DATA TABLE

Data table, handed in at the end of the period. One block per patient, one row per distinct colony type, columns for colour, form, elevation, and margin, filled in with the vocabulary from this sheet. Underneath it, your written conclusion: the possible identities your observations are consistent with, what supports each, and what you still cannot rule out. Coloured drawings in your notebook.

08 Check yourself

- [ ] Why can you not judge elevation by looking straight down at a plate? (How to do the work, step 6)
- [ ] One colony on your plate matches nothing on the culture key. Give the most likely reason, and explain why that is not a problem. (Step 11)
- [ ] Colony morphology narrows the field but cannot confirm an identity. Explain why, in one sentence. (Where students get stuck)