LESSON 6: Comparing Profitability in a Business

PREPARATION

Learning Goals
• I can organize and interpret real business data to identify patterns in revenue and costs over time. • I can build a spreadsheet model that captures a business's financial situation by category and use it to forecast future performance. • I can compare the profitability of different revenue categories and explain what that means for a business owner's decisions.
Content Language Objective
I can interpret profit and loss summaries and compare the profitability of different revenue categories to develop a recommendation using explanatory and compare and contrast language. [orally and in writing] **[Presentational]**

Explanatory and compare and contrast language:	Terms and notations:
• Since _____ , _____ . • Based on _____ , _____ will/should/could _____ . • _____ will/should/could _____ because/since _____ . • Given that _____ , _____ will/should/could _____ . • Whereas _____ , _____ , so _____ .	• Receipt • Invoice • Projection • Profit and loss summary • Cumulative

LESSON NARRATIVE

The purpose of this lesson is for students to compare profitability for different products and services in order to make predictions or recommendations for a business.

TEACHER REFLECTION

What practices do you use to foster collaboration among students so they can support each other in meeting high expectations? (***High Expectations***)

In the Warm-up, students make sense of how a business owner might categorize ***receipts*** and ***invoices*** for a business as they engage in a card sort. They build on this work in Activity 1, using their categorized receipts and invoices to create a profit and loss summary. This is the first time that students are building this type of model from data they have sorted themselves, rather than a pre-filled spreadsheet of data (*MSP: Model*). Students use their model to make a ***projection*** for future expenses and revenue.

In Activity 2, students analyze the profit and loss summary they have created to find trends within categories as they analyze the profitability of specific services offered in a business. Students leverage the model they are using to identify patterns in the data, then use those patterns to make recommendations for a business. They support their reasoning with evidence from their financial model (*MSP: Communicate*).

Big Idea
The big idea of this lesson is that modeling, analyzing, and comparing the profitability of various products and services in a business reveals information and patterns that can shape predictions and recommendations to guide business decisions.

© Coherent Math 2026. All Rights Reserved.

FOCUS AND COHERENCE

Building On	Addressing
• **HS.4.3:** Build on existing understanding of quantities, ratios, rates, proportions, and percentages to investigate and solve problems in authentic contexts.	• **MSP: Tools:** Use appropriate tools, including technology, strategically. • **HS.4.4:** Use functional models to solve and communicate about contextual financial questions such as credit card debt, installment savings, amortization schedules, mortgage and other loan scenarios. • **HS.4.5:** Analyze and critique mathematical models and describe their limitations. Develop models to estimate solutions to contextual questions, identify patterns, and identify how changing parameters affect the results. • **HS.5.4:** Use technology to visualize functions and explore how changes in one quantity affect the other.

LESSON AT A GLANCE (50 minutes)

Internet-enabled devices for spreadsheets are required for this lesson. It is ideal if each student has their own device.

<table>
<tr><td>LAUNCH</td><td colspan="2">Warm-up (10 minutes)</td></tr>
<tr><td></td><td colspan="2">Purpose: Categorize expenses and revenue for a business

Routine(s): Card Sort; Visibly Random Grouping

Materials: “Receipts and Invoices card sort” (print 1 set–November, December, January–per anticipated pair of students and cut up in advance)</td></tr>
<tr><td>EXPLORE</td><td>Activity 1 (20 minutes)</td><td>Activity 2 (10 minutes)</td></tr>
<tr><td></td><td>Purpose: Build a model of profit and loss for a business from unorganized data

Materials:
• Pre-cut cards from the Warm-up
• “M3.M5.L6 Spreadsheet” (direct students to make their own spreadsheet by selecting “Make a copy” when prompted)</td><td>Purpose: Analyze data and use the profit and loss model to make projections for a business

Materials: “M3.M5.L6 Spreadsheet” from Activity 1</td></tr>
<tr><td>SUMMARIZE</td><td>Lesson Debrief (5 minutes)</td><td>Cool-down (5 minutes)</td></tr>
<tr><td></td><td>Purpose: Summarize the lesson’s big ideas</td><td>Purpose: Demonstrate understanding of Lesson Goals and Content Language Objective

Materials:
• Internet-enabled device. (It is ideal if each student has their own device.)
• M3.M5.L6 Cool-down (print 1 copy per student)</td></tr>
</table>

LAUNCH

WARM-UP: Receipts and Invoices (10 minutes)

Instructional Routines: Card Sort; Visibly Random Grouping

In this warm-up, students engage in a *Card Sort* to compare receipts and invoices for Jada's business across three months. This sorting task offers students opportunities to recognize patterns that connect revenue and expenses with invoices and receipts (*MSP: Structure*).

CARD SORT	
	What Is This Routine? A *Card Sort* uses cards or slips of paper that can be manipulated and moved around (or the same functionality enacted with a computer interface). It can be done individually or in small groups; students should be encouraged to stand up and move while they work. Students put things into categories or groups based on shared characteristics or connections. This routine can be combined with *Take Turns*, such that each time a student sorts a card into a category or makes a match, they are expected to explain the rationale while the group listens for understanding. The first few times students engage in these activities, the teacher should demonstrate how the activity is expected to go. Once students are familiar with these structures, less set-up will be necessary. While students are working, the teacher can ask students to restate their question more clearly or paraphrase what their partner said. ***Why This Routine?*** A *Card Sort* provides an interactive opportunity to attend to mathematical connections using representations that are already created, instead of expending time and effort generating representations. It gives students opportunities to analyze representations, statements, and structures closely and make connections.

Step 1

- Use *Visibly Random Grouping* or another strategic grouping technique to arrange students in pairs. **Students will stay in these groups for the remainder of the lesson.**
- Display the following information about Jada's business for all to see.

RESPONSIVE STRATEGY

Encourage multilingual learners to use translanguaging, translation tools, or peer interaction as needed. When discussing the context for this task, allow 2 minutes for multilingual learners to translate the following words into their home language: "receipt" and "invoice." Students should write the translations for these words in their Student Workbook. (***Supports accessibility for: Language***)

Jada's Photography
- Offers event photography, brand content photos, portraits, and image licensing
- Has an online portfolio website
- Has been in business for 2 years

- Tell students they will sort receipt and invoice cards from Jada's business by matching cards that are connected or share characteristics.
  - Assign each pair one month of cards (November, December, or January). Distribute one set of "Receipts and Invoices" pre-cut cards (November, December, or January) to each pair of students.
  - Provide pairs of students 5–6 minutes to work together to sort the cards.



Advancing Student Thinking	
If students . . .	***Then . . .***
Sort quickly and have time remaining.	Encourage them to sort the cards in another way.

Monitoring	Monitor for students who: ● Sort according to expense versus revenue, or receipt versus invoice ● Sort according to project type (event photography, brand content photos, portraits, and image licensing) Let students know that they may be asked to share later. Include at least one student who does not typically volunteer.

Student Task Statement

Your teacher will give you one set of receipt and invoice cards from Jada's business. Sort the cards into categories based on shared features. Then, record the cards you placed in each category.

Step 2

- Invite previously identified students to share their categories.
  - Invite students to share what they know about receipts and invoices.
  - If no students bring it up, share that a "receipt" represents an expense that was paid, and an "invoice" represents revenue that was received.
- Ask students why those categories could be helpful for Jada to use when sorting her finances for her business. (Sorting by receipt versus invoice could help Jada categorize revenue and expenses quickly. Sorting by project type could help Jada see what projects are bringing in the most revenue or have the most expenses. Knowing this information could help Jada make decisions.)

EXPLORE

ACTIVITY 1: Modeling Jada's Data (20 minutes)

Building On: HS.4.3
Addressing: MSP: Tools; HS.4.5

In this activity, students use the data from the cards representing receipts and invoices to create a profit and loss summary. This gives students the opportunity to build the model from messy, unorganized data and experience a process similar to that which business owners engage in (*MSP: Model*). Students also have the opportunity to use a spreadsheet to deepen their understanding of using models to make predictions (*MSP: Tools).*

The receipts and invoices from the cards represent three months of data for Jada's business. Since the work of categorizing, sorting, and typing data is time consuming, data for additional months has been provided in the spreadsheet for students.

Step 1

- Tell students they will be creating a profit and loss summary similar to the ones they worked with in Lesson 5 for three months of Jada's business using the receipts and invoices they have sorted.
- Direct students to access the "M3.M5.L6 Spreadsheet." Students will be prompted to make their own copy of the spreadsheet. Direct students to name the spreadsheet "[their name] M3.M5.L6."
  - Encourage students to revisit Jada's business descriptions in the Student Lesson Summary and Glossary from Lesson 1, as needed.

Advancing Student Thinking	
If students . . .	***Then . . .***
Would benefit from an example or model for formulas in their spreadsheet.	Tell them to navigate to the spreadsheet they created for Lesson 5 to use as an example.

Monitoring 	Monitor for students who: • Calculate an average for each category using all nine months of data, then use that value to make a projection • Choose the same values from prior months for future months to make a projection • Try to account for the general trends, stability, or other factors when making a prediction Let students know that they may be asked to share later. Include at least one student who does not typically volunteer.