Lesson Plan - Transportation Math

<table>
<thead>
<tr>
<th>Learning elements</th>
<th>Data Accuracy, Exponents, Bar Graphs, Money, Thinking, Conversion, Relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contributes to these Educational Standards</strong></td>
<td>Math, Reading, Relationships, Safety</td>
</tr>
<tr>
<td><strong>Supports these CRLs</strong></td>
<td>Critical Thinking, Problem Solving</td>
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<tr>
<td><strong>Learning Environment requirements:</strong></td>
<td>Central focus space to set the stage. Individual work space to perform the math calculations. Flip chart, blackboard or overhead device to demonstrate example math problem. One copy of <em>Story Problem Hints</em>, and <em>Transportation Math</em> exercises per learner.</td>
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</tbody>
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**Introduction**

Trucks carry many different products to many different places. Almost everything we buy has been delivered by truck to a store or to our homes.

We will apply the math we have learned by solving story problems involving truck drivers and the math they encounter in their daily work. We will solve some math puzzles and riddles also.
<table>
<thead>
<tr>
<th>Objective</th>
<th>Time</th>
<th>Teaching Points</th>
<th>Supplies</th>
<th>Vocabulary Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Solve addition, subtraction, multiplication and division math problems, using transportation examples.</td>
<td>4 min</td>
<td>Introduce the Transportation Math Exercise sheet</td>
<td>Transportation Math Exercise sheet</td>
<td></td>
</tr>
<tr>
<td>#2 Use math symbols $+, -, \times, \div, \geq, \leq, =$</td>
<td>3 min</td>
<td>Expect learners to write equations while solving story problems</td>
<td></td>
<td></td>
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<tr>
<td>#3 Recognize pertinent information needed to solve the story problem.</td>
<td>4 min</td>
<td>Demonstrate an example where a story problem may have more information than needed, and the need to focus on what the question is to help determine which information is pertinent to the problem.</td>
<td>Story Problem Hints handout</td>
<td></td>
</tr>
<tr>
<td>#4 Recognize exponents and calculate results</td>
<td>10 min</td>
<td>Review conversion information if needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#5 Given a bar graph, use the correct data to solve word problems.</td>
<td>12 min</td>
<td>Demonstrate how to read bar graphs if needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#6 Given an Bill of Lading, accurately complete the form and perform the math functions needed</td>
<td>10 min</td>
<td>Introduce the form. This is a primary, universally recognized communication form in the trucking industry. Point out areas to be completed, and emphasize the importance of data accuracy. Reflection: Can we name some effects that could occur as a result of data errors? o Content o Cost o Schedule o Delivered to wrong place o Delivered wrong quantity o Collect the wrong payment</td>
<td>Bill of Lading exercise</td>
<td>Bill of Lading Customer order number Commodity Liability Pallet Slip</td>
</tr>
</tbody>
</table>
#6 Given an Bill of Lading, accurately complete the form and perform the math functions needed (continued)

- Who would be impacted by data errors?
  - The customer (didn't get what they ordered)
  - The customer’s customers (the product may not be available when needed)
  - The truck driver (reflects badly on his integrity. Can affect his paycheck, or ability to gain future driving jobs)
  - The trucking company (reflects on the company, may affect ability to gain future orders)
  - You (overall cost of living could be affected)

- Review the correct data and the correct placement of where the data should be placed. Acknowledge good data accuracy techniques.

<table>
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<tr>
<th>Wrap-up</th>
<th>2 min</th>
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<tbody>
<tr>
<td>Total:</td>
<td>45 min</td>
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Math Transportation Exercises
Name________________

1.) Tracy loads $4^{11}$ cantaloupes into her belly dumper. How many cantaloupes did she load?

2.) Tracy drove $2^8$ miles today. How many miles did she drive?

3.) Tracy drove $4^4$ minutes today. How many hours did she drive today? Please round to the nearest hour.

4.) $14^3$ cars traveled past Tracy in the opposite lane. How many cars were going the opposite direction?

5.) If it costs Tracy 60 cents per mile for fuel and maintenance costs, how much did it cost Tracy to drive her truck today (refer to question #2 to see how many miles Tracy drove today).

6.) Marty charts his fuel usage for the week. How much fuel did he use?
7.) Carrie hauls the following items this week:

![Graph showing quantities of items delivered by day](image)

How many tennis shoes did she deliver?

How many T-shirts did she deliver?

How many tank tops did she deliver?

How many total items did she deliver this week?

8.) Pat is getting ready to deliver fence posts to a lumber company. He needs to fill out a bill of lading before he begins his trip. Please use the following information to complete the bill of lading. Accuracy is very important.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Type</th>
<th>#Pkgs</th>
<th>Weight</th>
<th>Commodity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>4’ posts</td>
<td>2</td>
<td>270 lbs.</td>
<td>4’ Fence Posts</td>
</tr>
<tr>
<td>300</td>
<td>5’ posts</td>
<td>3</td>
<td>486 lbs.</td>
<td>5’ Fence Posts</td>
</tr>
<tr>
<td>200</td>
<td>6’ posts</td>
<td>2</td>
<td>406 lbs.</td>
<td>6’ Fence Posts</td>
</tr>
<tr>
<td>300</td>
<td>8’ posts</td>
<td>3</td>
<td>810 lbs.</td>
<td>8’ Fence Posts</td>
</tr>
</tbody>
</table>

There are no pallets or slips. There is no additional shipper information, nor any special instructions.

Freight charges are “collect”, COD, and Fees were prepaid. COD Amount: $3350

The Bill of Lading number is 20353, Carrier Name: EZ Carryall, Trailer number 712, Seal number 1127.

The trailer was loaded by the shipper, Quality Fence Posts, PO Box 91453, Oregon City, OR 97045

The freight was counted by the driver, who is delivering to Woody Lumber Company, 12 Post Way, Woodburn, OR 97071
Story Problems Tips:

Look for these key words to help decide whether to add, subtract, multiply, or divide:

**ADDITION**
- Sum
- All
- Together
- Total
- In all
- Altogether

**SUBTRACTION**
- Difference
- Left
- Less than
- Fewer than
- Greater than
- More than
- How many more?
- How many less?

**MULTIPLICATION**
- Product
- In all
- Times
- All
- If each one costs $5, how much will 10 cost?

**DIVISION**
- Quotient
- Each
- Divide equally
- Per
- Average
- If 10 cost $50, how much will one cost?

Draw a picture as you read the story. For example, if a truck driver loads 35 boxes into the truck, then delivers 20 of them, how many boxes are still in the truck?

35 boxes

35-20

15 boxes are still in the truck...

Adapted from *Teaching Thinking and Problem Solving in Math* by Char Forsten (Scholastic Professional Book, 1992)