## **Job Hunting**

You are looking for a job after school and you look in the local paper. You see the following 3 jobs that seem interesting.

(1) Baby-sitting 2 young children: Work after school 2 hours per day Monday, Wednesday and Friday; pays \$4.50 per hour.

(2) Delivery route: Deliver 100 papers each day after school Monday through Friday; it should take 45 minutes per day using a bike and 1 hour 15 minutes per day if you walk. It pays 5 cents per paper.

(3) Work for the Green Mountain Bank: mow lawn, shovel snow, empty trash, etc. Work 5 hours per week; pays \$3 per hour. This job pays \$10 per week overtime for special projects (rake leaves, trim bushes, file papers, etc.) which amounts to \$10 extra (you can count on this overtime).

If you had your choice of any of these jobs, which job would you decide to take?

Compare each job - maybe for a few months (you decide how many months are necessary for you to be sure you are getting the best job).

Show all your data and give mathematical reasons why you are choosing one job over the other two jobs.

Grade Levels 3 - 5

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### Context

I was surprised at how engaged my students were in this problem. I noticed, however, that a good deal of their discussions were about which job would allow them to do sports after school or that they like kids or that they did not like raking leaves. I had to make it clear that I wanted to see the mathematics in their solution as well as other ideas. I stressed that they would mainly be graded on their mathematical ideas. They walked out the door talking about which job they wanted to take.

## What This Task Accomplishes

This task will show what students can keep track of and work with a couple of variables: time working per week and amount of money earned. Each job presents this information differently.

## What the Student Will Do

The student will need to find a way to compare the jobs. They will have to figure out how much

they will earn for each job. They will also have to compare the amount of time each job will take. They will need to juggle these variables with their own after school schedules and interests. The first job description is straight forward. The newspaper job does not give the amount earned per hour and the bank job indicates overtime, but the student will need to determine how much overtime they think they will need to do for \$10.

## Time Required for Task

#### 1-2 hours

The task takes 45 minutes to present to students and allow them to get started thinking about strategies. It takes another 30 minutes for them to complete their responses (or complete for homework).

### **Interdisciplinary Links**

This problem can be given to students in a guidance program to talk about life skills and interests.

### **Teaching Tips**

Spend a fair amount of time discussing each job so all students understand each constraint. Discuss how hard it is to compare jobs because the information is given in different forms. Talk about the need to get the jobs described in a similar way.

#### **Suggested Materials**

- Graph paper
- Lined paper

## **Possible Solutions**

This is an open-ended problem. There is no one correct answer. However, the mathematics they do and how they compare each job determines their level of performance.

Here is some of the mathematics:

#### Baby-Sitting:

2 hours/day x 3 days (Monday, Wednesday, Friday) x \$4.50/hour = \$27 per week.

#### Newspaper Route:

100 newspapers/day x 5 cents/newspaper x 5 days = 25 per week. Average one hour per day so this job earns about 5/hour.

#### Bank Job:

5 hours per week x \$3/hour = \$15 per week. Plus overtime: about 2 - 3 hours a week for \$10/week. For a total of 5 - 6 hours/week and \$25/week. This job earns between \$4.17 and \$5/ hour.

### **Benchmark Descriptors**

#### Novice

The student does not have the correct money earned for the bank job. There is no evidence of a strategy or procedure. There is little evidence of mathematical reasoning since there is no explanation of the solution. There is inappropriate use of the dollar sign and no use of mathematical representation.

#### Apprentice

The solution is not complete. The student did not choose which job s/he thought was the best and why. The student did use a strategy that is partially useful. S/he found out how much s/he would earn for the first and second job. S/he did not complete the amount earned in the third job. There is some evidence of mathematical reasoning. There is some use of mathematical notation (however the dollar sign is used incorrectly).

#### Practitioner

The solution shows that the student has a broad understanding of the problem and the major concepts necessary for its solution (except the hours for the bank job). S/he uses a strategy that leads to a solution and uses effective mathematical reasoning. There is a clear explanation, appropriate use of mathematical representation, terminology and notation.

#### Expert

The solution shows a deep understanding of the problem including the ability to identify the appropriate mathematical concepts and the information necessary for its solution. Uses refined reasoning. There is a clear, effective explanation detailing how the problem was solved. All the steps are included so that the reader does not need to infer how and why decisions were made. Mathematical representation is accurate and communicates ideas related to the solution of the problem. There is appropriate use of mathematical terminology and notation.

### Novice

PAPEr rout





Hours 6 Minotso Noney 274

Bank work Hours G minots p This part of the solution is incorrect. money 18 \$

## Apprentice

The student uses some The student attempts to basic math language to communicate what was communicate, although done to obtain a solution. some is inaccurate. I added 4.50 And 4.50 and I  $\widehat{}$ So you get 25th a week B) Three dullars to every hour and you work 5 days and That is is dallars overtimeyou 3 and 2 hours and you get 10.00 Which you take would you why? The student neglects to reach a conclusion on which job is best and why. No mathematical representation is used to communicate a solution.

# Exemplars -

## Practitioner

The student clearly communicates the solution and supporting reasoning.	I would choose Working for Green Mountain Bank. Because I could do 5 hours any day of the week. So if I get sick or I Have a Sport I can malce up for it the next day. You get good Pay, its fun and as I already said you Can do it any day of the week.	
All work is documented and labeled.	I Wouldn't baby Sit because if you get gick you miss it and you don't get payed. I also thin baby sitting is boring and wot actin you get the best pay but its not worth it.	KR.
Accurate and appropriate math language is used.	I wouldn't do paperroute becau its a pain in the butt Just viding a bike getting off every Hereand there to deliver the paper. You get the same pay as Green Mountain Bank but its to not worth doing.	1 SC    -
4.50 21 9.00 de 3 de 27.00 P X 4 W 108.0	hour 100 Papeers \$3.00 hour nours per x8.05 \$ for Paper X5 hours per aday 5.00 Per day 15.00 Week ys X 5 days 10.00 extrd per Week 25.00\$ per week 25.00 \$ per week x 4 weeks Damonth \$100.00 month \$100.00 a month	

## Practitioner

Job Hunting									
Days weeks Months	Job#1		Job#2		<b>Љь</b> #З				
\$ Per Hour	<b>\$</b> 4.50		910.05 Per Paper		\$ 3.00				
9 Per Week	\$ 27.00		\$ 25.00		引氏の + 10.00 ext.				
\$ Per Month	<b>§</b> 108.00		₽ 100.00		\$ 100.00				
Hours Per Day	2 Hours		45 Min		0-5 Hours				
Hours per Week	6 Hours		JHows 25 Min.		5 Hours				
Hours per Month	24 Hours		9 Hours 35 Min		a4 Hours				
Days Worked Nonth	12 Days		20 Days		1-5 Parys				
Total Hours Dollars Days Permonth	24 Hours \$108.00 12 Davis Per month	<b>1</b>	9.35 100.00 20Days Permonth						

The student uses an accurate and appropriate math representation.

### Expert

Job # 1=\$41.50 (Howmuch you get a day) <u>X</u> (e) (Haw many hours do you work a week). 3 daysaweek 27.00(You get 27 dolburs a week) <u>X 2 hours per day</u> 6 hours per week

Expert

Hunting

I think the baby sitting job is the best deal of the three jobs because you only work 3 days a week and you get 2700. Even though you work 6 hours a week compared to 3 hours 45 min a week which is job # 2 and 3 hrs. 45 min is on your bile and you can't ride your bike in the winter so it takes you Ghours 15 min to walk. Also you only work 3 days a week and in job number 2 you work 5 daysa week. You get 27.00 aweek for job # 1 and for job # 2 you get 25.00 perweek. Job # 4 is a better cleal also because you get two free days during the week and get two dollars more than in job # 3, were you work 6 days. a week. I would not pick job # 3 because you get \$25.00 a week but you work 7 or 8 hours a week because of the \$6.00 overtime.

The student justifies his/her solution, and		Amount of money Perday	Daysof Work & hrs. of Work	total amount of hrstmoney perweel
explains his/her decision-making.	Babysitting	\$4.50 per > hour	Zhrs perday_ Mon., - Wed., Fri.	\$27.00 -Perweek - 6 hrs. perweek
The student creates an	Delivery Route	100 papers \$ osperpaper \$ 5.00 X ) perday	45min or Ihrismin perchy Mon-Fri	\$2500 per Week Cohvers 15 min 5 hrs 45 min per week
accurate and appropriate math representation to communicate the solution.	Green Mountain Bank	\$300 per hour \$10.00 ) overtime each week	5hrs per week+1-3 hrs.overtime anyday	*25.00 per Week 78 hrs perweek