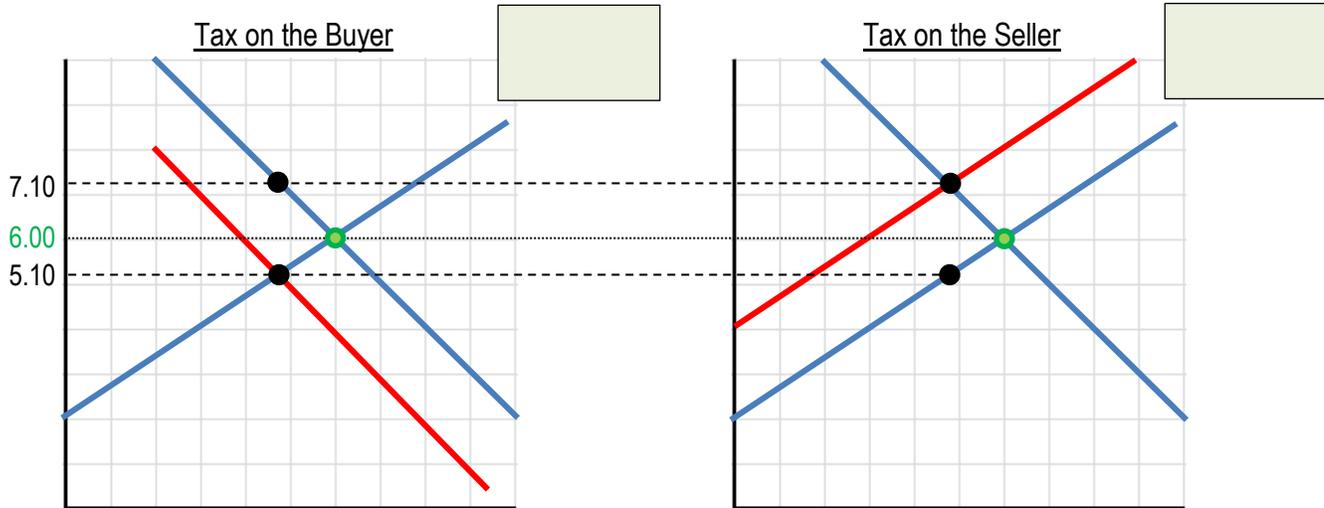


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CONCEPT: INTRODUCING TAXES AND TAX INCIDENCE

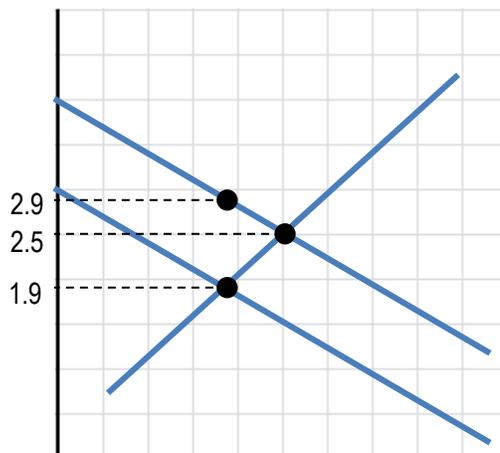
- Taxes allow the government to provide public services. Taxes can either be imposed on the buyer or the seller of a good.
 - The tax shifts the curve of the party paying the tax to the _____ by the amount of the tax.
 - Total amount the buyer pays = _____ Total amount the seller receives = _____
 - A tax will *always* make the quantity exchanged _____ than the equilibrium quantity.
 - The party paying the tax does not necessarily bear the burden of the tax entirely.



- The **tax incidence** is the manner in which the burden of the tax is shared.

Total Tax	Consumer's Tax Incidence		Producer's Tax Incidence	
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EXAMPLE: The following graph depicts the market for a bag of magic beans. If the government imposes a tax of one cow on buyers of magic beans, what is the tax incidence on producers of magic beans?

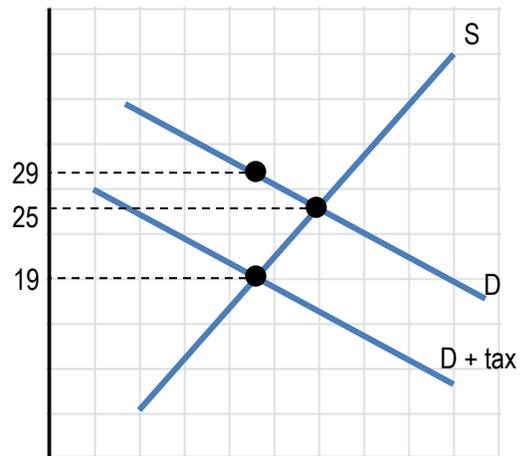


PRACTICE: If a tax is levied on the sellers of a product, the demand curve:

- a) Shifts to the left in an amount equal to the tax
- b) Shifts to the right in an amount equal to the tax
- c) Does not change
- d) Is inelastic

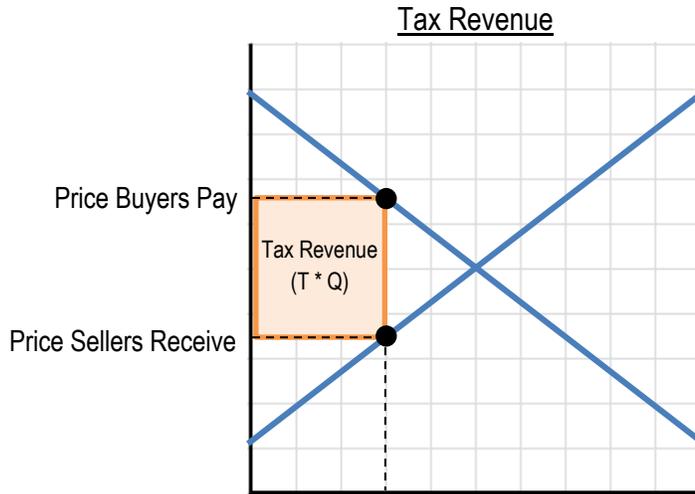
PRACTICE: A tax was levied upon buyers of a good. What is the amount sellers receive after the tax is imposed?

- a) 19
- b) 25
- c) 29
- d) None of the above

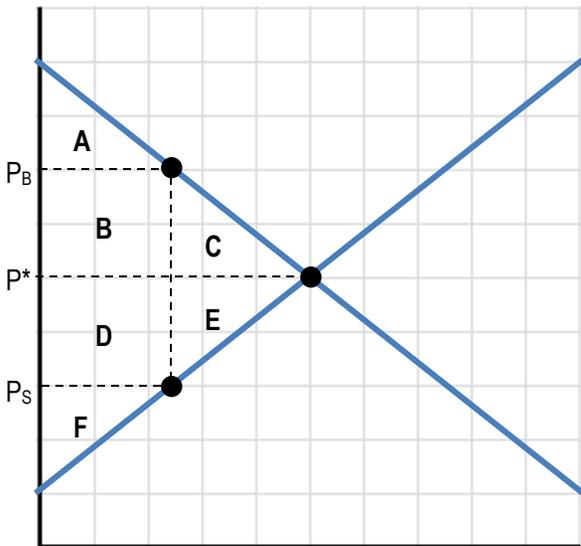


CONCEPT: EFFECTS OF TAXES ON A MARKET

- The **tax revenue** represents the total amount of tax collected, calculated as: _____

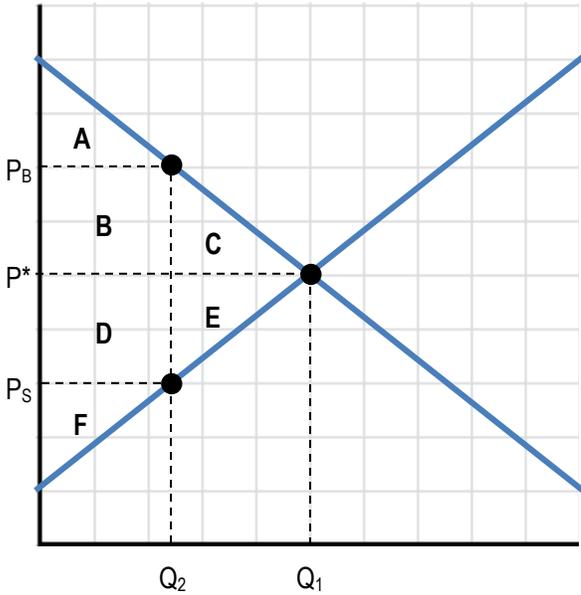


- When a market is not in equilibrium, the loss of economic surplus is called a _____



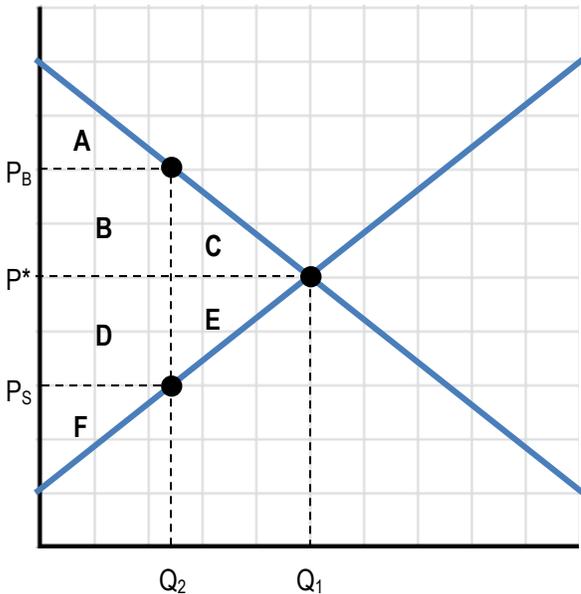
	Without Tax (P*)	With Tax (P _B and P _S)	Change
Consumer Surplus			
Producer Surplus			
Tax Revenue			
Economic Surplus			
Deadweight Loss			

PRACTICE: If a tax has caused the market-clearing quantity to fall to Q_2 , what is consumer surplus?



- a) The area of (A)
- b) The area of (A), (B), and (C)
- c) The area of (A), (B), (C), (D), and (E)
- d) The area of (A), (B), (C), (D), (E), and (F)
- e) The area of (C) and (E)

PRACTICE: If a tax has caused the market-clearing quantity to fall to Q_2 , what is total economic surplus?

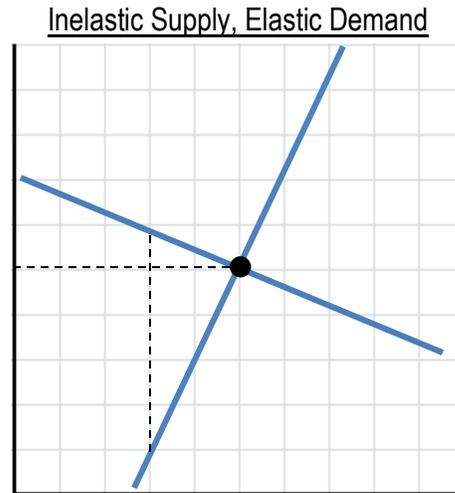
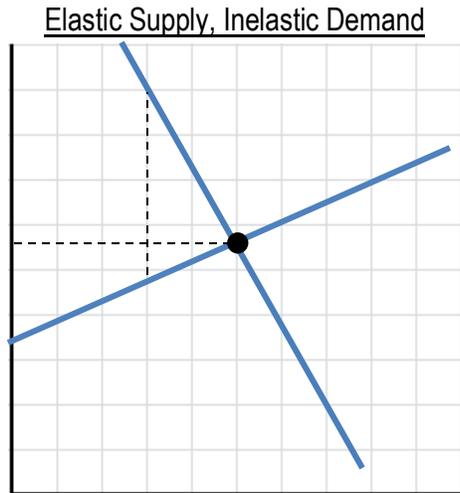


- a) The area of (A) and (F)
- b) The area of (D), (E), and (F)
- c) The area of (A), (B), (D), and (F)
- d) The area of (A), (B), (C), (D), (E), and (F)
- e) The area of (C) and (E)

CONCEPT: ELASTICITY AND TAXES

● The burden of the tax is split between buyers and sellers based on the _____ of the curves.

□ The party paying the tax does not necessarily bear the burden of the tax entirely.



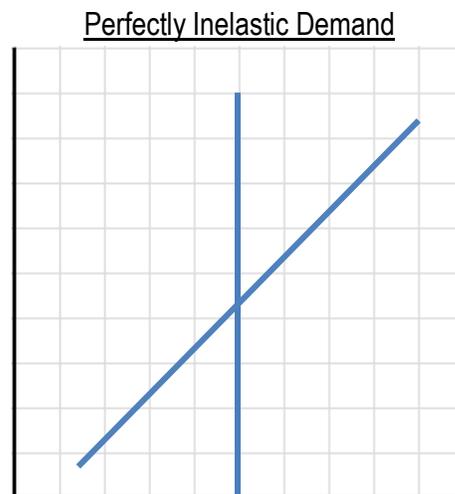
□ The curve that is more inelastic represents the group who will have _____ tax incidence.

- Demand Curve more inelastic →

- Supply Curve more inelastic →



_____ bears entire tax burden



_____ bears entire tax burden.

PRACTICE: A \$1 per-unit tax levied on consumers of a good is equivalent to

- a) A \$1 per unit tax levied on producers of the good
- b) A \$1 per unit subsidy paid to producers of the good
- c) A price floor that raises the good's price by \$1 per unit
- d) A price ceiling that raises the good's price by \$1 per unit

PRACTICE: A tax imposed on consumers of a good:

- a) Creates a loss only for consumers
- b) Creates a loss only for producers
- c) Creates a deadweight loss for society as a whole
- d) Creates a net gain for society as a whole

PRACTICE: Suppose that a unit tax of \$2 is imposed on producers with initial equilibrium of \$10. If the demand curve is vertical and the supply curve is upward-sloping, what will be the price faced by consumers after the tax?

- a) \$8
- b) \$10
- c) \$12
- d) There is not enough information.

CONCEPT: SUBSIDIES

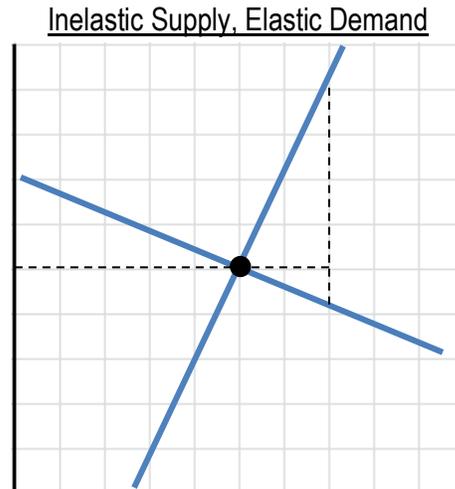
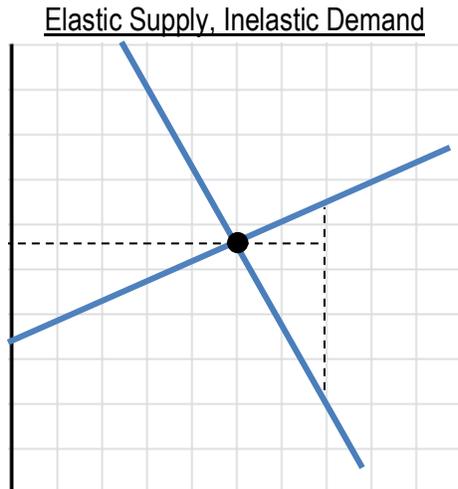
● A **subsidy** is money paid by the government to market participants. It is effectively a “reverse-tax.”

□ Our conclusions remain similar:

- The party receiving the subsidy does not necessarily get the full benefit of the subsidy payment.
- The split of the benefits depends on the price elasticities of supply and demand.
- Subsidies cause deadweight loss from *over-trading*

□ However, these ideas are different:

- The subsidy shifts the curve of the party receiving the money to the _____ by the subsidy amount.
- P_b and P_s are inverted. Now, the amount buyers pay is less than the amount sellers receive.



□ The curve that is more inelastic represents the group who will receive _____ subsidy benefit.

- Demand Curve more inelastic →
- Supply Curve more inelastic →

□ Whoever pays more tax (i.e. more inelastic), gets more subsidy benefit (i.e. more inelastic)

PRACTICE: A government wants to increase the use of solar panels by offering a \$100 subsidy for each solar panel purchased. The addition of this subsidy will:

- a) Increase the quantity supplied
- b) Decrease the quantity supplied
- c) Create a deadweight loss in the market for solar panels
- d) Both (a) and (c)

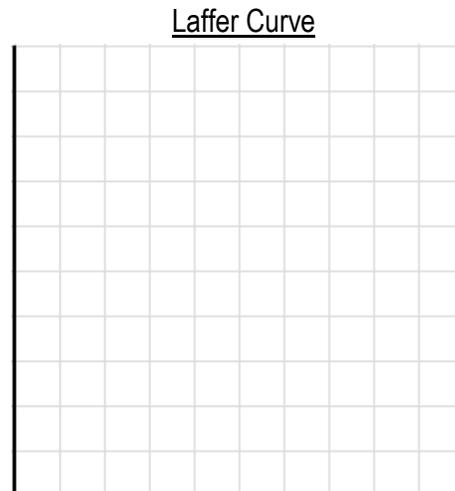
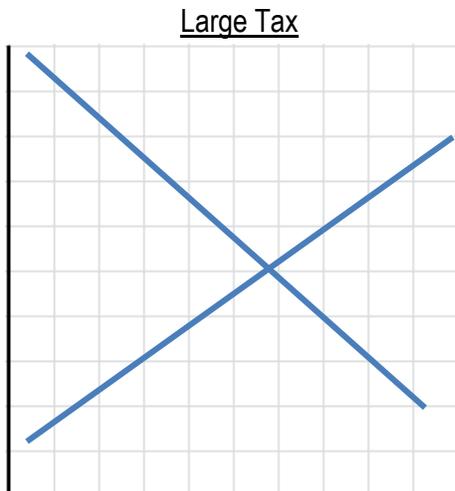
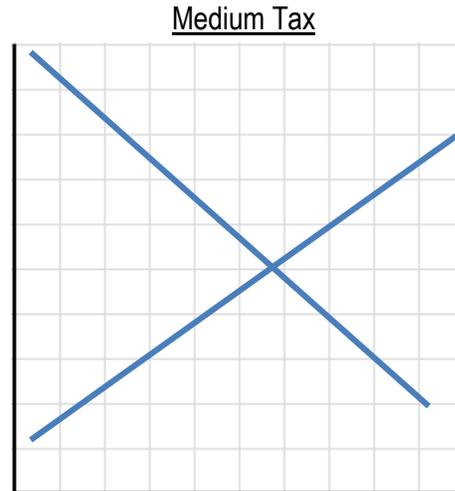
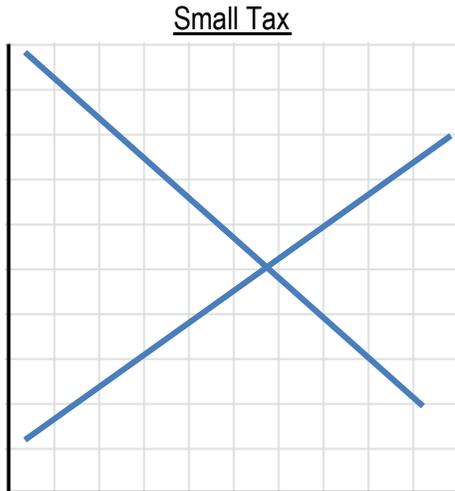
PRACTICE: The government wants to help producers of a life-saving machine, so they introduce a \$1,000 subsidy per machine produced. Assuming that demand for this machine is inelastic, the subsidy will:

- a) Increase the price paid by consumers by \$1,000
- b) Increase the price paid by consumers by less than \$1,000
- c) Decrease the price paid by consumers by less than \$1,000
- d) Have no effect on the price paid by consumers

CONCEPT: LAFFER CURVE

- A larger tax does not necessarily lead to higher tax revenue

□ When the size of the tax increases, the quantity exchanged _____



- The **Laffer Curve** depicts the relationship between the size of a tax and the amount of tax revenue

□ Arthur Laffer, creator of the Laffer curve, suggested that the USA is already on the downward-slope of the curve:

□ This implies that larger taxes would have multiple negative effects:

- Less _____

- Less _____

CONCEPT: QUANTITATIVE ANALYSIS OF TAXES

- We can use algebra to determine the effect of a tax.
 - To find the new equilibrium quantity and price with a tax:
 - Step 1: Replace P with (P – Tax) in the supply OR P with (P + Tax) in the demand
 - Step 2: Solve for the new equilibrium by setting $Q_D = Q_S$ using the new equation.
 - Step 3: The equilibrium price is the amount paid/received by the non-taxed party.
 - Step 4: Solve for remaining price paid/received
 - > If consumer taxed, add tax to new equilibrium price to find price consumers pay.
 - > If producer taxed, subtract tax from new equilibrium price to find price producers receive.

EXAMPLE: The original supply and demand curves are as follows. What is the new equilibrium price and quantity if suppliers are taxed \$1 per unit? What is the amount suppliers receive? What is the amount consumers pay?

$$Q_S = 2P - 6$$

$$Q_D = 10 - P$$

P* =	Q* =	Suppliers Receive =	Consumers Pay =
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PRACTICE: The supply and demand curves for a product are as follows. What is the amount suppliers receive if a \$0.50 tax is imposed upon consumers?

- a) \$2.80
- b) \$3.00
- c) \$3.20
- d) \$3.30
- e) \$3.50

$$Q_D = 600 - 100P$$

$$Q_S = -150 + 150P$$

CONCEPT: TAX EFFICIENCY

- *Tax efficiency* implies that one system of collecting taxes can be more efficient than another system
 - There are two efficiency problems that arise from imposing a tax system:
 - **Deadweight Loss** – inefficiencies that arise from trades that do not occur due to restriction on free trade
 - > Taxes raise the prices consumers pay and lower the revenues producers receive
 - **Administrative Burden** – resources used in _____ and _____ of tax policies
 - > Taxpayers must spend time filling forms and keeping records for tax purposes
 - > The government must employ the IRS and agencies to enforce compliance
 - > These “wasted” resources are also a type of deadweight loss
- Two tax calculations are important when compromising between an efficient and equitable tax system:

$\text{Average Tax Rate} = \frac{\text{Total Taxes Paid}}{\text{Total Income}}$ <p>The average rate you pay on all your income</p>	$\text{Marginal Tax Rate} = \frac{\Delta \text{Taxes}}{\Delta \text{Income}}$ <p>The amount that taxes increase from an additional dollar of income</p>
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EXAMPLE: The government taxes the first \$50,000 earned at a rate of 20%, while all income above \$50,000 is taxed 50%. Calculate the average tax rate and marginal tax rate for a person earning \$80,000.

- The most efficient possible tax system would be a _____ tax
 - Example: The government imposes a tax of \$5,000 on every citizen. Every person owes the same amount.
 - This tax would not cause deadweight losses insofar as it does not affect decision making.
 - The *marginal tax rate* on earning additional income is _____
 - The ease of calculating taxes would also minimize the *administrative burden* (no paperwork, simple enforcement)
 - This system is uncommon because there are two goals for a tax system: efficiency and _____

<u>\$10,000 in income</u>	<u>\$25,000 in income</u>	<u>\$100,000 in income</u>
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CONCEPT: TAX EQUITY

- *Tax equity* deals with the fairness of the tax system. How should the tax burden be divided? How do we judge if it's fair?
 - **The Benefits Principle** – people should pay taxes on the benefits they receive

<u>Gasoline Tax</u>	<u>Marina Tax</u>
Benefit:	Benefit:
Who pays?	Who pays?

- **Ability-to-Pay Principle** – people should pay taxes based on how easily they can afford them
 - > All taxpayers should make an equal “sacrifice” to pay taxes

<u>\$1,000 tax on a \$10,000 income</u>	<u>\$1,000 on a \$50,000 income</u>	<u>\$10,000 on a \$50,000 income</u>
Disposable Income:	Disposable Income:	Disposable Income:

- > This suggests that more taxes should be raised from people with higher incomes than lower incomes
- > This is also referred to as **vertical equity** (taxpayers with higher incomes pay more taxes)

- **Horizontal Equity** – people in the same economic situation should pay the same amount of taxes

The Sick Family earn \$100,000, have no children, and pay \$40,000 in medical expenses.	The School Family earn \$100,000, have four children, and pay \$60,000 in tuition.
Are they in the same economic situation? Should the Sick Family or School Family receive a tax break?	

- In each of the following tax systems a higher income taxpayer pays more:
 - **Regressive Tax** – the tax rate _____ as income increases
 - **Proportional Tax** – the tax rate _____ as income increases
 - **Progressive Tax** – the tax rate _____ as income increases

Income	Regressive Tax		Proportional Tax		Progressive Tax	
	Tax %	Amount of Tax	Tax %	Amount of Tax	Tax %	Amount of Tax
\$50,000						
\$100,000						
\$200,000						