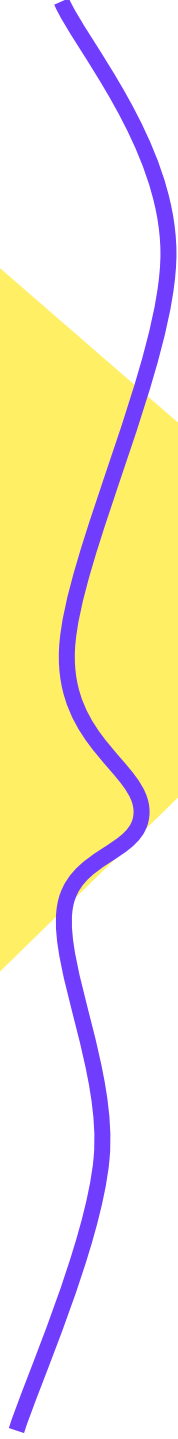




# NEONATAL ABSTINENCE SYNDROME

THERE ARE TWO GROUPS OF CHILDREN  
EMERGING AS PARTICULARLY CHALLENGING  
TO THE EDUCATION SYSTEM



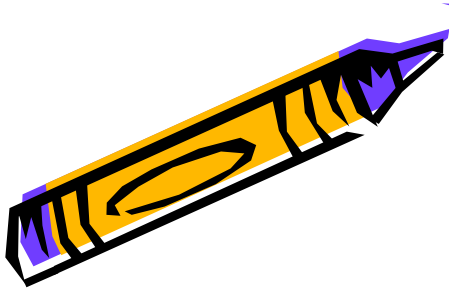
# WHO ARE THESE GROUPS.



# CHILDREN WHO ARE PRENATALLY EXPOSED TO

- COCAINE,
- MARIJUANA,
- HEROIN,
- PRESCRIPTION DRUGS,
- METHAMPHETAMINE,
- TOBACCO &

THOSE AFFECTED BY ALCOHOL



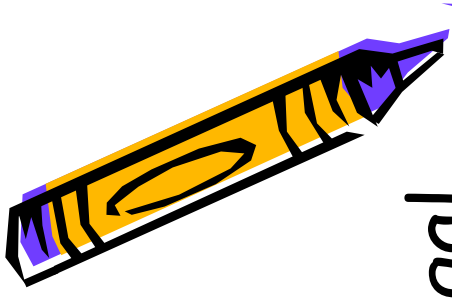
—

## Drug Use During Pregnancy

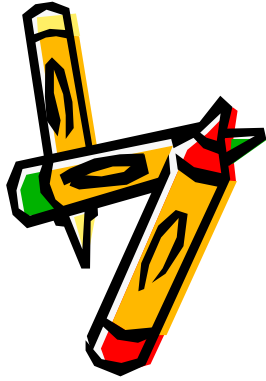
- Nearly 3 percent of pregnant women use illegal drugs such as marijuana, cocaine, ecstasy, amphetamines, and heroin.
- These and other illegal drugs may pose various risks for unborn babies and pregnant women.

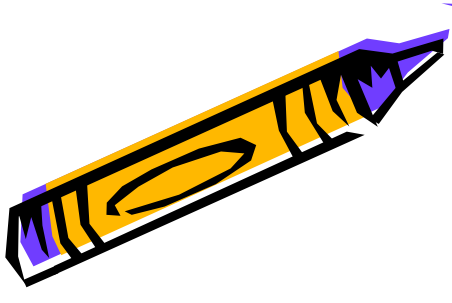
Centre for Disease Control and Prevention





- Most pregnant women who use illegal drugs also use alcohol, tobacco, over the counter and prescription drugs.



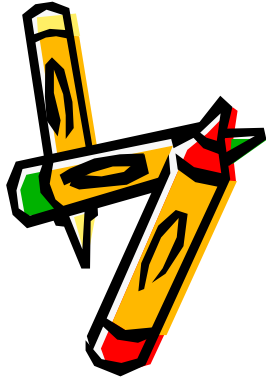


Drug addiction in the mother also  
cause the fetus to become addicted.



# What is Neonatal Abstinence Syndrome?

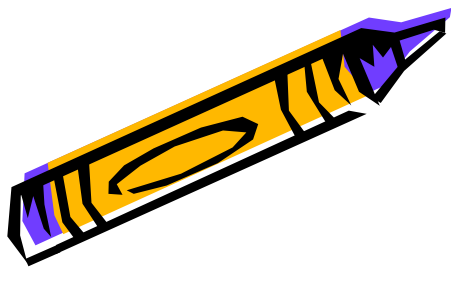
A term used for a group of problems a baby experiences when exposed to drugs during development and after birth. NAS primarily affects an infant's central nervous system.



# History

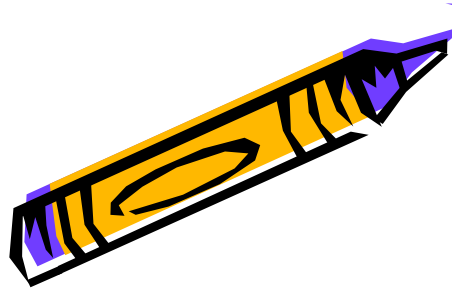
- NAS was once described as withdrawal from opioids but now includes manifestation from cocaine, amphetamine, and alcohol withdrawal. Also important to the neonate is the combined effect of tobacco, alcohol, caffeine, and other drugs.

- <http://www.emedicine.com/ped/topic2760.htm> Article by Jaques Belik, MD



# Drugs associated with NAS

- Opiates and narcotics such as Codeine, Heroin, Morphine, Barbiturates, Caffeine, Cocaine, Diazepam Ethanol, Marijauna, and Nicotine



# BACKGROUND

## 2 major types of NAS

Prenatal NAS and Postnatal NAS.

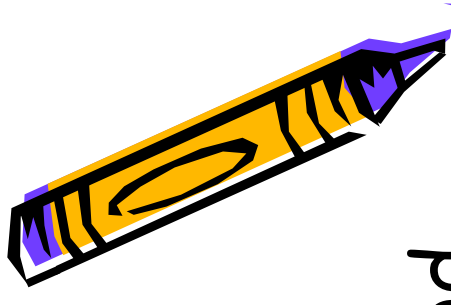
- Maternal substance abuse is referred to as prenatal NAS and has both medical and developmental consequences for the newborn.
- Postnatal NAS refers to the iatrogenic type, (physician induced) where the neonate is cut off abruptly after prolonged exposure to opioid analgesia.

<http://www.emedicine.com/ped/topic2760.htm> Article by Jaques Belik, MD



# What causes Neonatal Abstinence Syndrome?

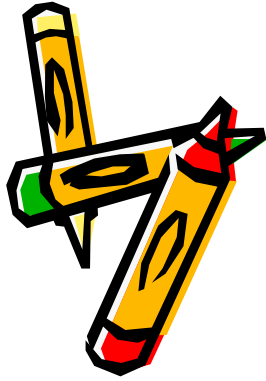
- Drugs pass from the mother's blood stream through the placenta to the fetus.

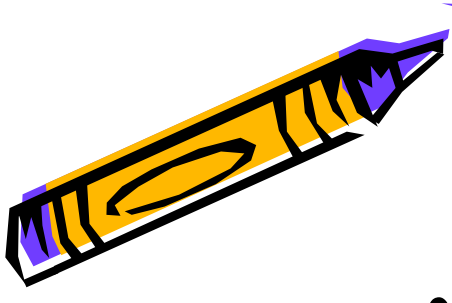


# Early Development of Fetus

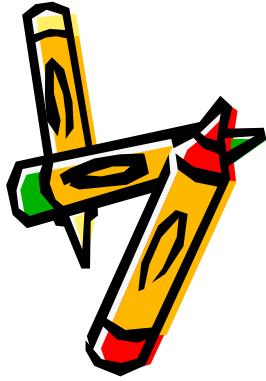
Week 1 & 2 - Gestational Age:

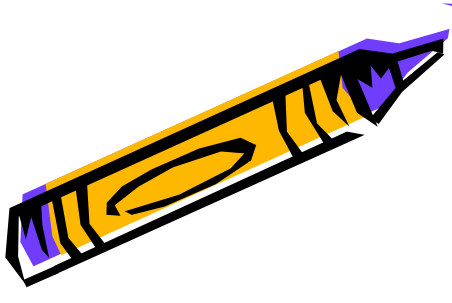
- The menstrual period has just ended and your body is getting ready for ovulation. For most women, ovulation takes place about 11 - 19 days from the first day of the last period.



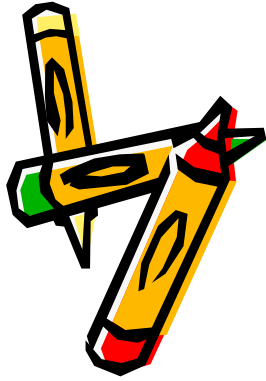


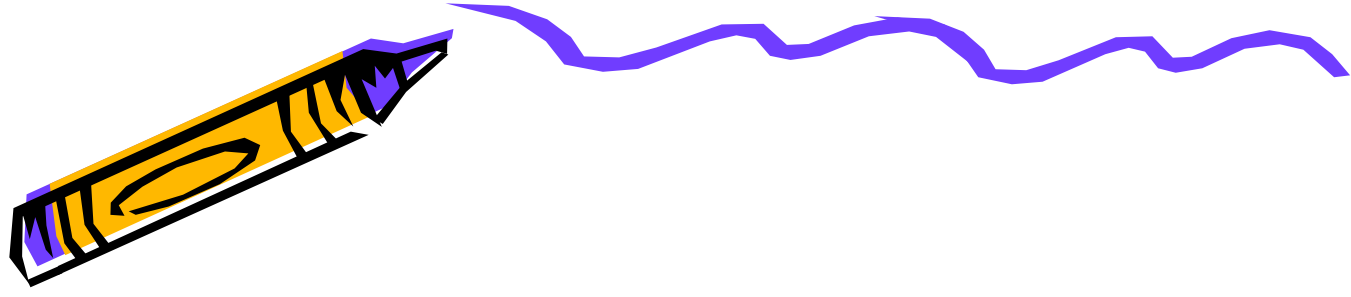
- Several hundred million sperm are released in the vagina. Sperms will travel through the cervix and into the fallopian tube.





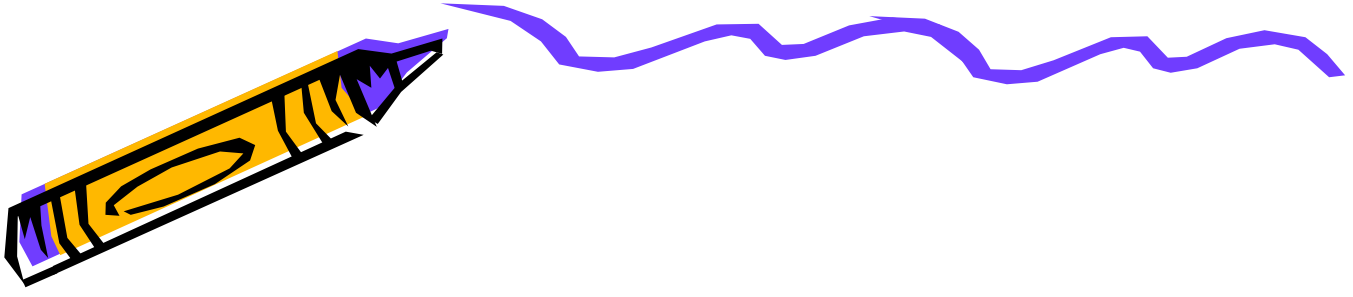
- The fertilized egg spends a couple days traveling through the fallopian tube toward the uterus. Anywhere from day 6 - 10 since conception.



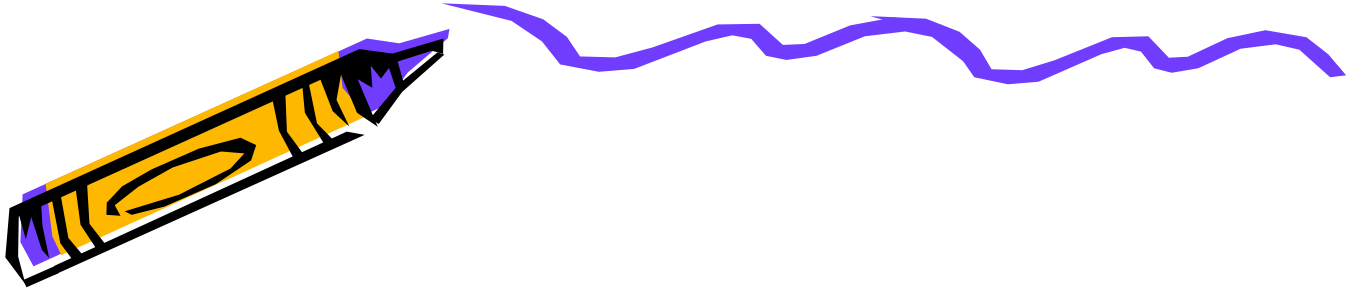


4 wks embryo

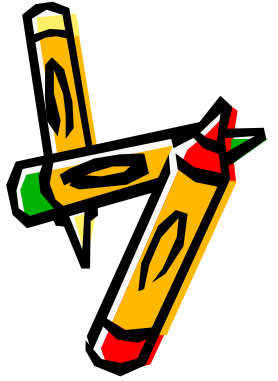
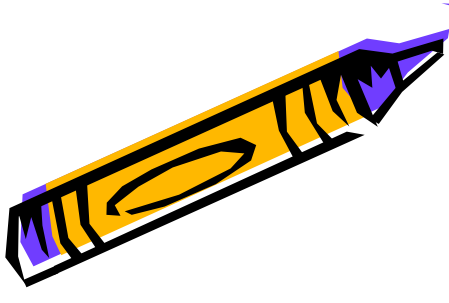




9 weeks- Through the medical technique called **embrioscropy**, the baby can be watched sleeping, waking-up, yawning, turning, and stretching;



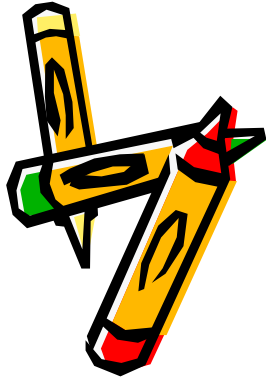
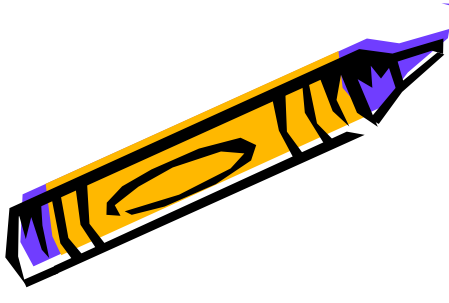
16 wks 5 ½ inch tall and only 6 ounces in weight, eyebrows, eyelashes and fine hair appear. can grasp with his hands, kick, and even somersault!



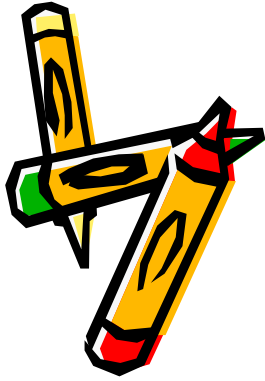
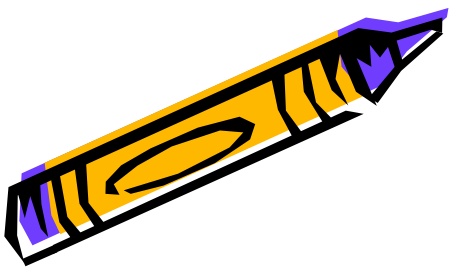
# Why is Neonatal Abstinence Syndrome a concern?

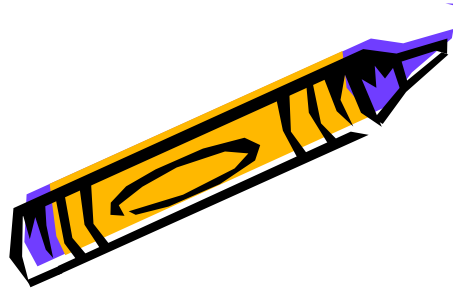
- A mother using drugs may be less likely to seek prenatal care.

Why do you think they may not seek care?

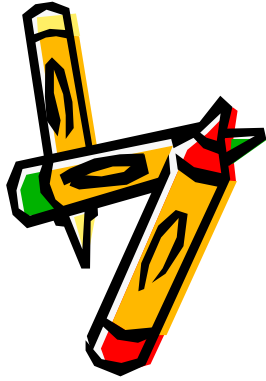


- Drug-dependent women may have unreliable indicators of pregnancy, because of the irregular menstrual cycles and confusion between withdrawal and pregnancy symptoms.



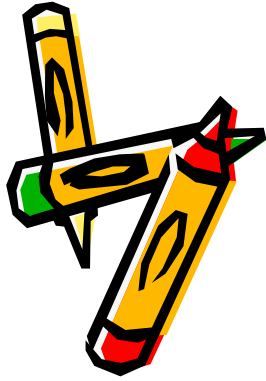
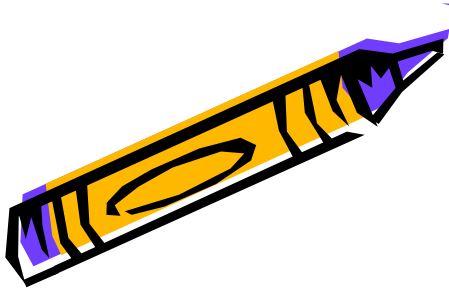


- In 1992, Looock and associates made a retrospective estimate of the proportion of babies born with significant antenatal exposures over 2 years in several Vancouver neighborhoods.
- In the Downtown Eastside, this proportion was about 30%, and at the time of the study *all* of the exposed babies were in government care.



# Topics for discussion

- Withdrawal/Symptoms
- Some drugs that can cause (NAS)
- Effects of each drug on fetus/child.



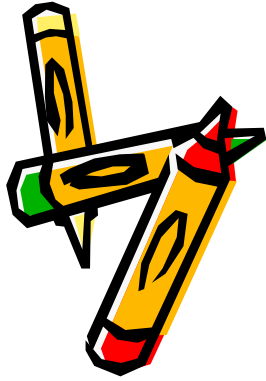
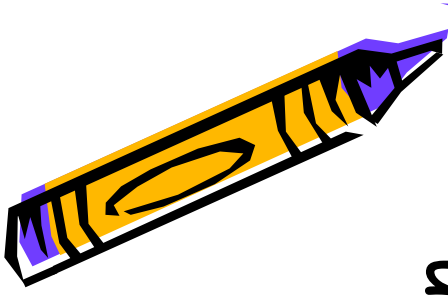


# Withdrawal



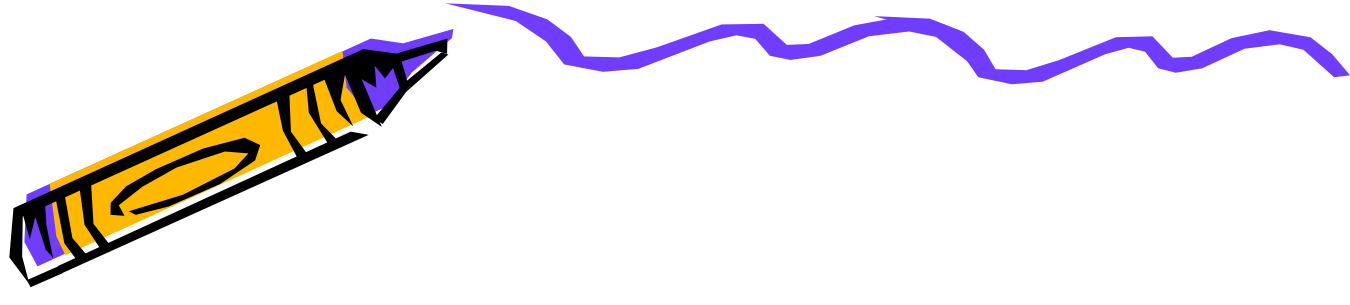
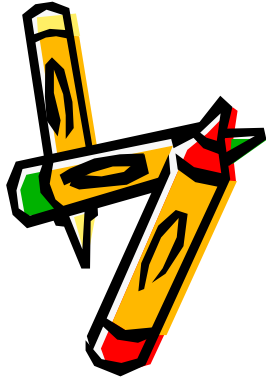
# Withdrawal

- At birth, the baby's dependence on the substance continues. However, since the drug is no longer available, the baby's central nervous system becomes over stimulated causing the symptoms of withdrawal.

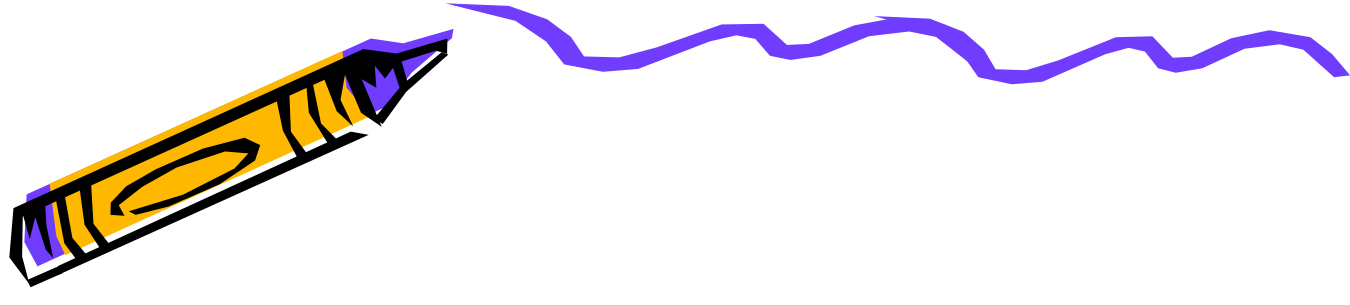
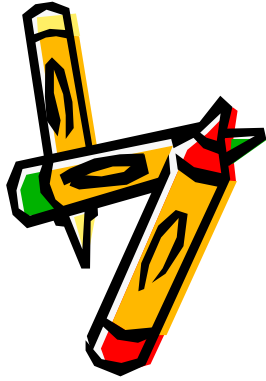


# Symptoms

- Tremors
- Irritability (excessive crying)
- Sleep problems
- High pitched crying
- Tight muscle tone
- Hyperactive reflexes
- Seizures
- Yawning, stuffy nose, and sneezing



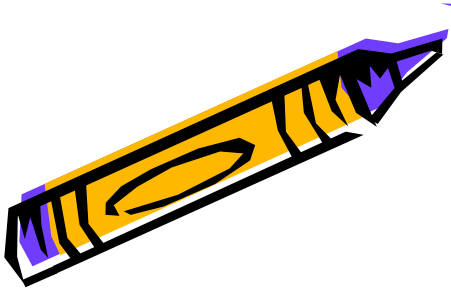
- Poor feeding and suck
- Vomiting
- Diarrhea
- Dehydration
- Sweating
- Fever or unstable temperature

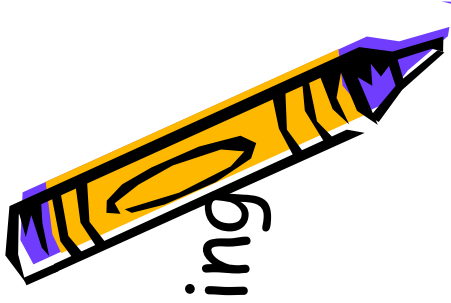


Premature babies may not have the classic signs of withdrawal listed above, but more often experience the following symptoms:

- Tremors
- High-pitched crying
- Rapid breathing
- Poor feeding

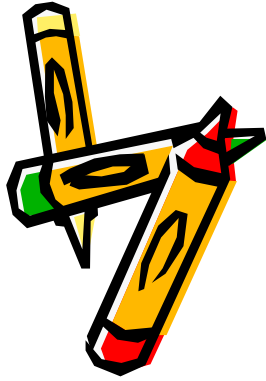
The symptoms of NAS resemble other conditions or medical problems always consult your baby's physician for diagnoses





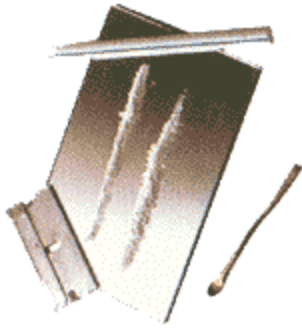
- There is also the risk of contracting HIV and AIDS.
- **Over 80% of children who contract AIDS are born to drug-abusing mothers or mothers with a drug-abusing partner.**

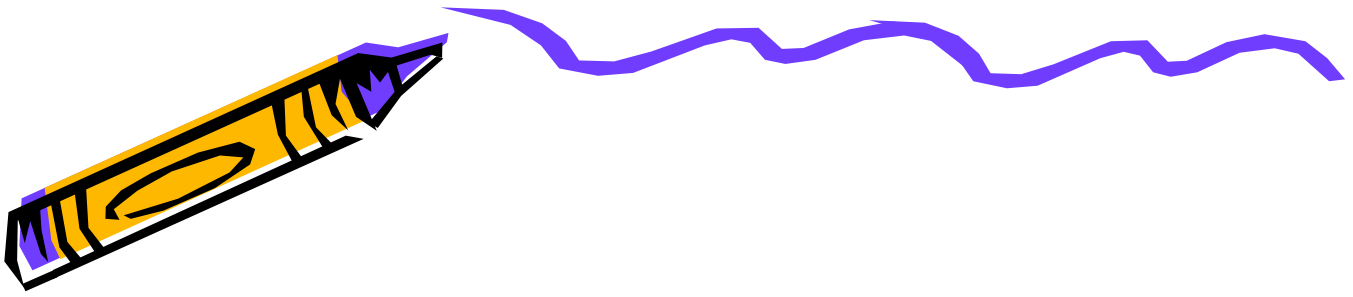
National Institute on Drug Abuse (NIDA) 1990  
National Household Survey on Drug Abuse



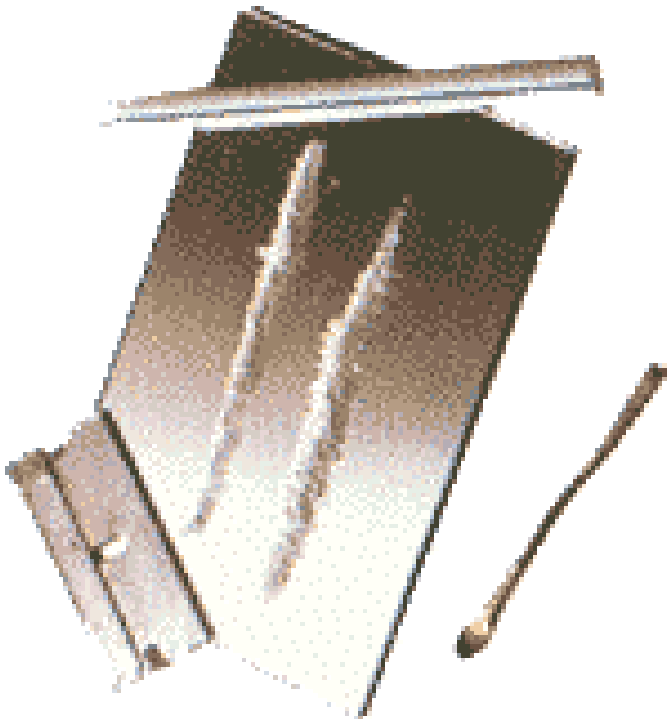
# Commonly used drugs:

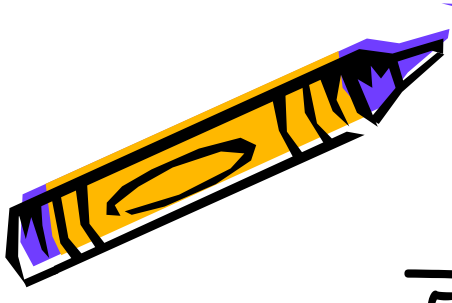
Cocaine,  
Heroin,  
Marijuana,  
Nicotine,  
Meth,  
Prescription drugs and  
Alcohol





# COCAINE



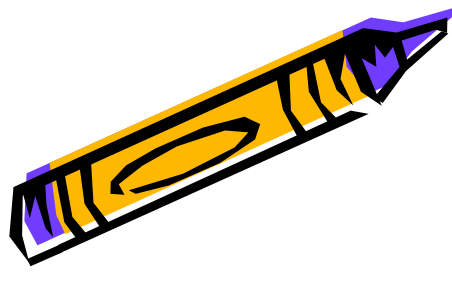


- Cocaine may cause some withdrawal, but the main symptoms in the baby are due to the toxic effects of the drug itself.



# COCAINE

- The exact risk of cocaine exposure to an individual is unknown.
- Cocaine, as well as other narcotics, seem to have similar effects on a user's child.
- Cocaine decreases blood flow to the placenta and fetus.



4D



4D FETAL PROFILE



# Cocaine:

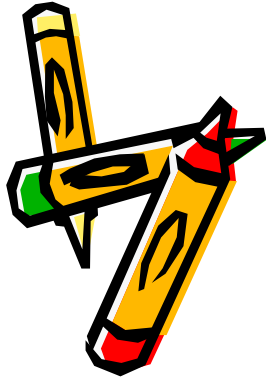
- If a woman uses cocaine 1 or 2 days prior to delivery, it can be detected in the urine of the newborn for as long as 96 hours after birth. This is due to the slower metabolism of the liver of a newborn.

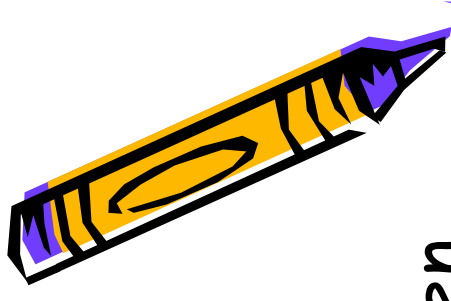
(van de Bor, Walther, & Sims, 1990)



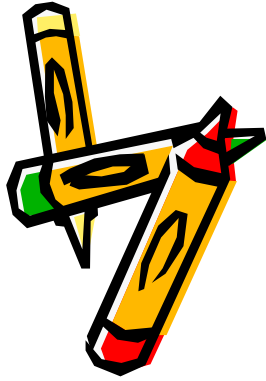


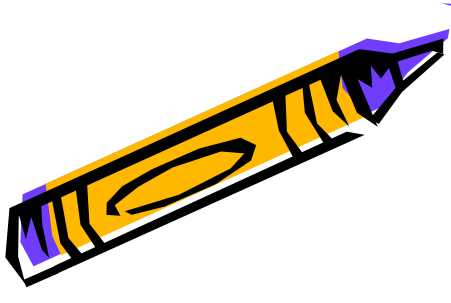
Infants can actually suffer prenatal strokes before birth, have a higher incidence of kidney and breathing disorders.





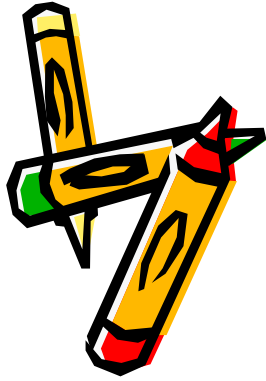
- Neurobehavioral abnormalities have been well documented in cocaine-exposed infants. 10% demonstrated unexplained jitteriness.
- It has been found that infants had serious depression of interactive behavior and poor organizational response to environmental stimuli.



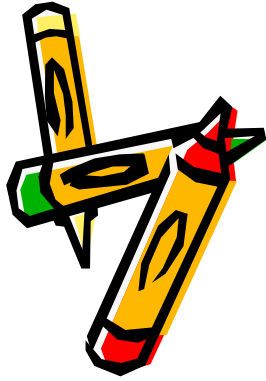
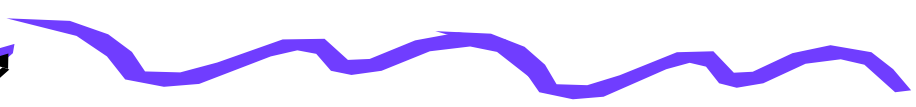
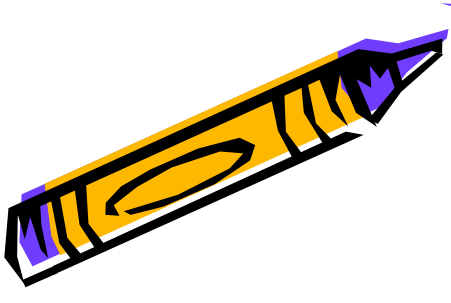


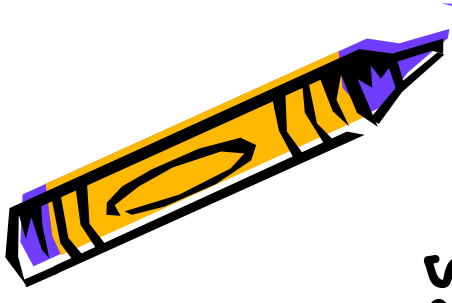
Infants feel stiff when their limbs are moved and demonstrate excessively extended postures.

- Tremors in arms and hands occur.
- As they grow older, they tend to retain their primitive reflexes.

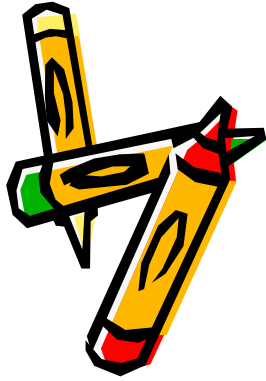


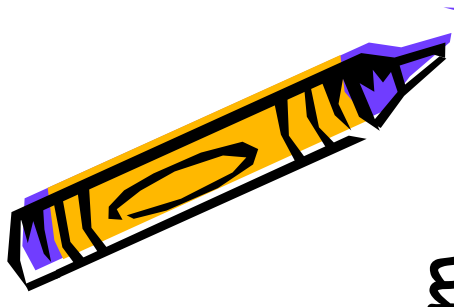
- The primitive reflexes need to be replaced by more mature movement patterns if normal development is to occur;



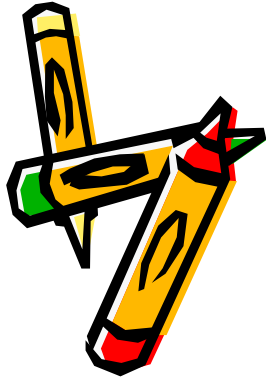
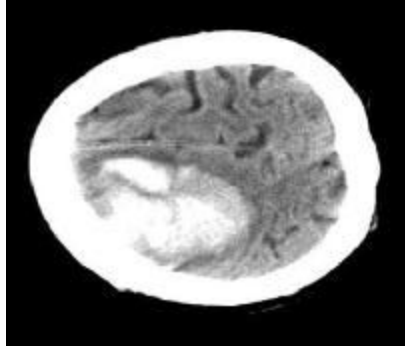


- Demonstrate physical abnormalities such as microcephaley and malformation of limbs, such as absence of arms below the elbow, missing digits, or missing forearm bones.



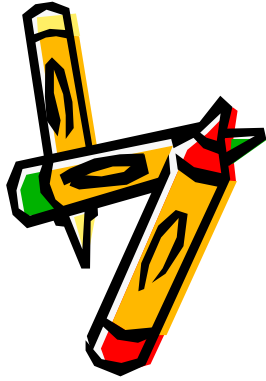
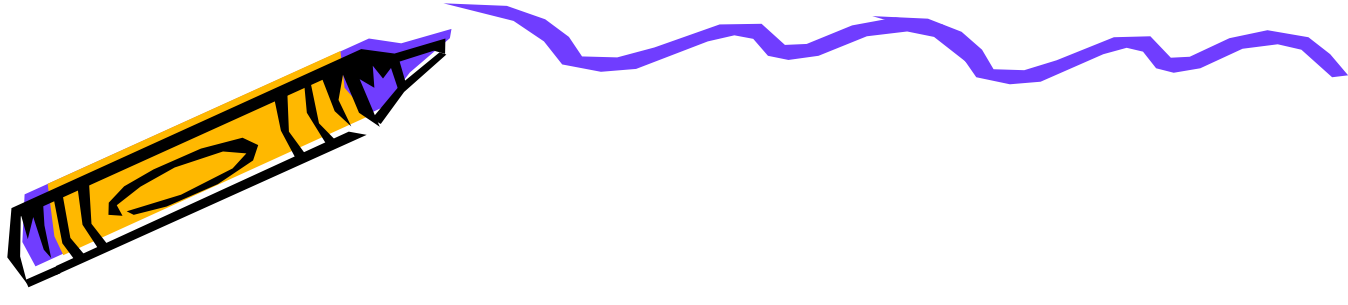


- Increased cerebral blood flow from cocaine use can put infants at a greater risk of intracranial hemorrhage after birth.



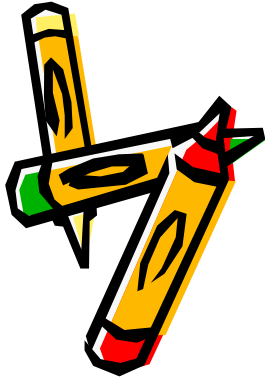
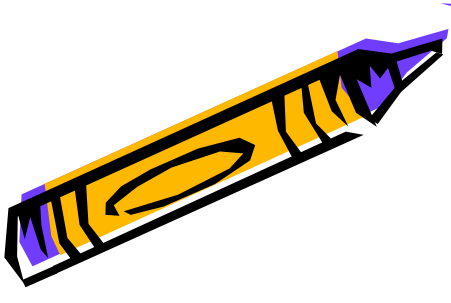
<http://www.emedicine.com/NEURO/topic177.htm>

- Display low average range on developmental scales.

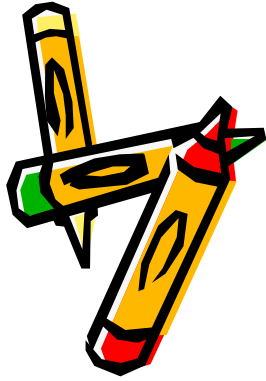
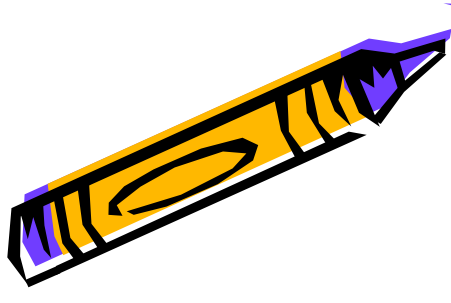


# DEFICITS

- Unstructured free play situations that require, self-organization, self-initiation, and independent follow through.
- Demonstrate significantly less representational play with play characterized by scattering, batting, and picking up and putting down toys.



- Most alarming results where the type, location, and distribution of lesions on the brain, which suggested neural damage which are not clinically evident in infancy or early childhood but only after the first few years when more complex visual-motor and social cognition tasks are required of the preschool and school age child.

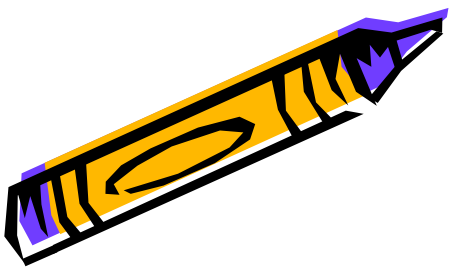


Most frequently reported characteristics of cocaine-exposed infants.

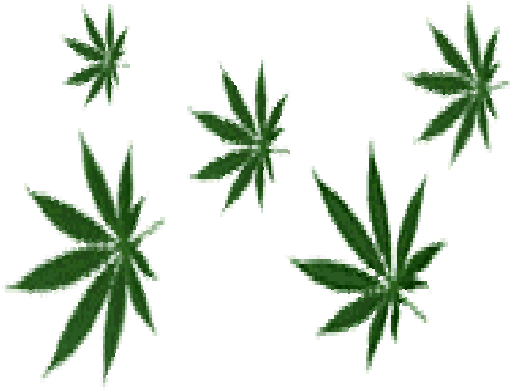
- Low birth rate,
- Prenatal growth retardation which includes, delayed cognitive, motor, and perceptual performances in a follow up study through 3-7 years of age

(Harvey, Prince, Burton, Parkinsons, & Campbell. 1982)





MARIJUANA



# Marijuana

Is stronger and more dangerous than it was during its first widespread usage in the 60's.

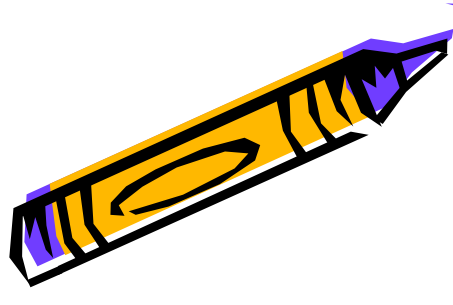
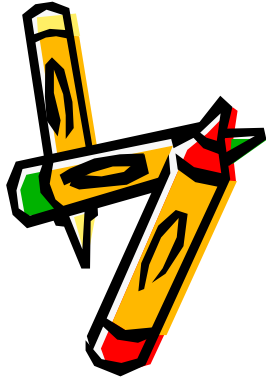
Other drugs can be mixed with marijuana, drugs like angel dust (PCP) that can cause permanent brain damage.



# How harmful is marijuana?

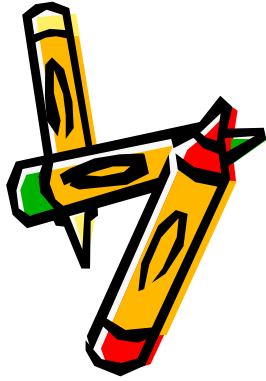
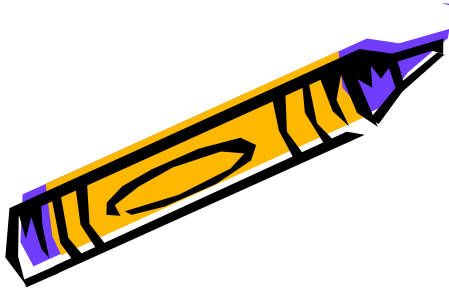
- More harmful than tobacco, it contains up to 50% more tar and cancer causing chemicals than cigarettes.
- Stays in body up to 3 weeks
- Can cause lung diseases and bronchitis, emphysema, and cancer.

[www.aadac.com](http://www.aadac.com)



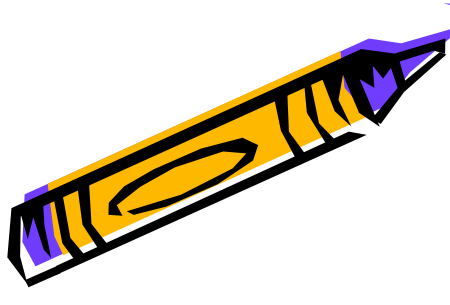
# Damage to Females

- Marijuana appears to have the opposite effect on women than it has in men
- Testosterone levels increase. This causes women to develop dark body hair, facial hair and acne.
- Disrupts normal menstrual cycles, and may interfere with ovulation.



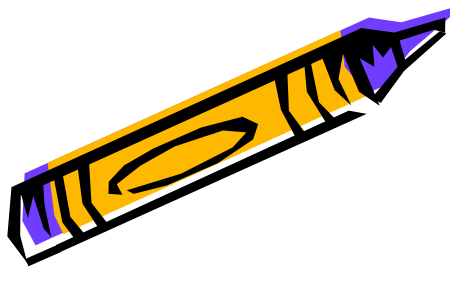
# Damage to Males

- Since marijuana reduces testosterone levels, male fetuses who are deprived of high testosterone levels needed for proper development may have deformed genitals.



- Since human eggs are present in women from birth, the eggs are vulnerable to damage from prolonged marijuana use. After fertilization, it is still in danger of being injured by active ingredients found in marijuana

W.R. Spence, MD: 1992 HEALTH ED CO



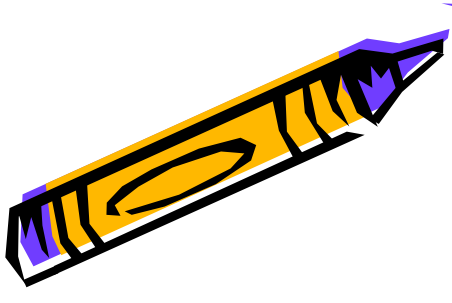
# Marijuana Effects on baby

Recent studies show that pregnant women who smoke marijuana are frequently at high risk of stillbirth, miscarriage, low birth-weight babies, and fetal abnormalities - especially of the nervous system. Babies also display withdrawal symptoms.

(Fetal Alcohol Syndrome, National Health Video)



- This is a concern for abnormal neurological, cognitive, and behavioral development as they approach school age.





- Trying to assess the outcome of in utero exposure to marijuana is complex. In many of the studies on marijuana exposure and pregnancy outcome, women who consume marijuana also smoked tobacco, drank alcohol, or used other drugs.

Eran Kozer, MD; Gideon Koren, MD, FRCPC  
February, 2001

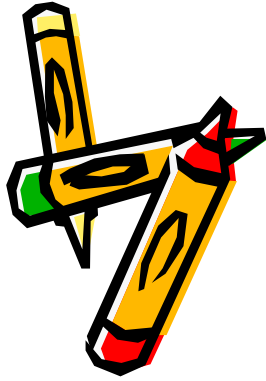


- Marijuana is probably the most common illegal drug used during pregnancy.

Effects of prenatal exposure to marijuana

Eran Kozer, MD; Gideon Koren, MD, FRCPC

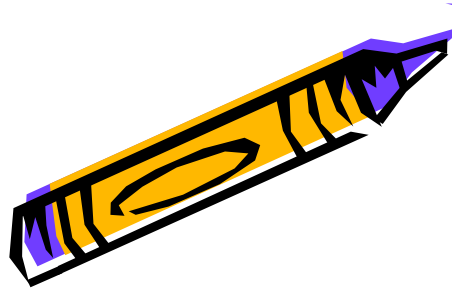
February, 2001

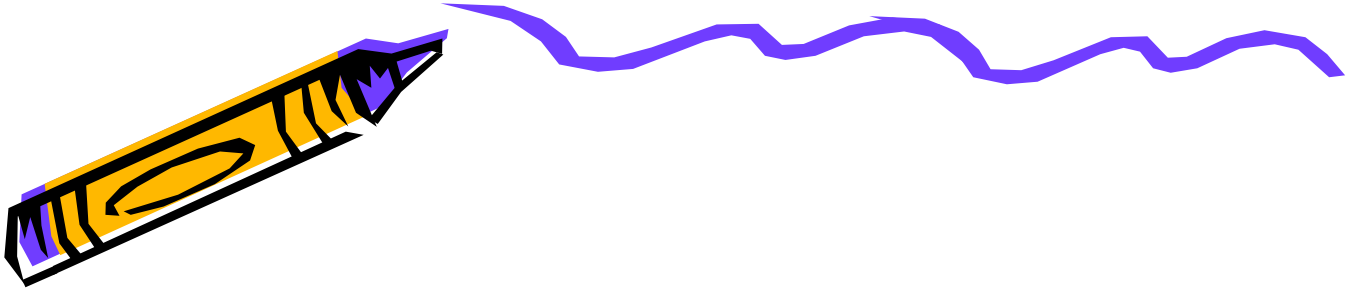


# Marijuana and breastfeeding

- Tetrahydrocannabinol (THC) is transferred into breast milk and levels can be up to eight times higher than in the mother's bloodstream.
- Exposure to marijuana through breast milk might delay infants' motor development.
- The American Academy of Pediatrics considers use of marijuana as a risk factor for breastfeeding.

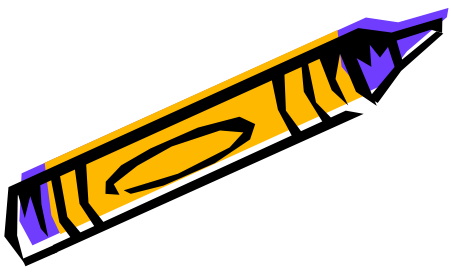
The American Academy of Pediatrics





HEROINE





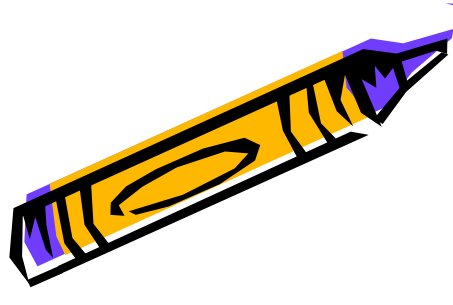
- Some drugs are more likely to cause NAS than others, but nearly all have some effect on the baby.
- Opiates, such as heroin and methadone, cause some withdrawal in over half of babies exposed prenatally.



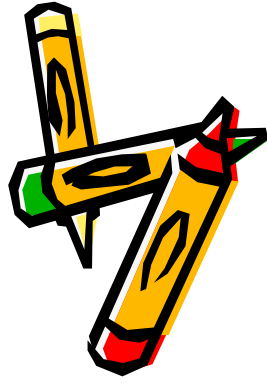
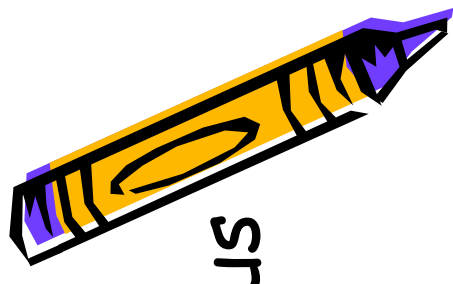
Infants born to women addicted to heroin or methadone  
are more likely  
to be:


- Still born
- placental abruption,
- poor fetal growth,
- premature rupture of the membranes (the  
woman's water breaks too soon), premature  
delivery and stillbirth.

•



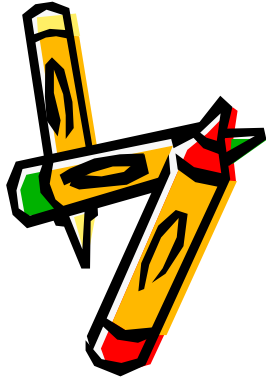
- These babies, most of whom are premature, often suffer from serious health problems.
  - Breathing problems
  - Brain hemorrhages,
  - Hyaline membrane disease of the lungs,
  - Respiratory distress syndrome.





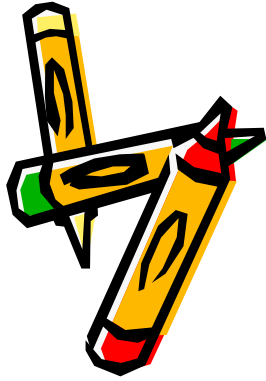
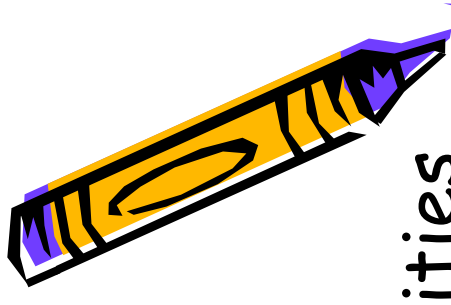
• Statistically, children born to heroin-addicted mothers are also at higher risk of (HIV) infections, and sudden infant death syndrome (SIDS).

• [http://corp.aadac.com/other\\_drugs/the\\_basics\\_about\\_other\\_drugs/opioids\\_and\\_preg\\_nancy\\_beyond\\_abcs.asp](http://corp.aadac.com/other_drugs/the_basics_about_other_drugs/opioids_and_preg_nancy_beyond_abcs.asp)



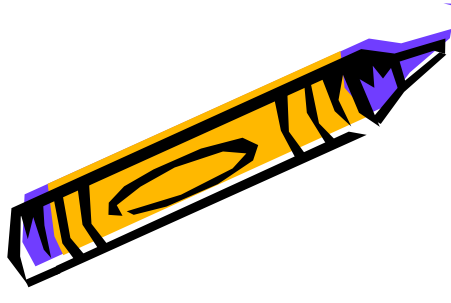
# EFFECTS ON FETUS

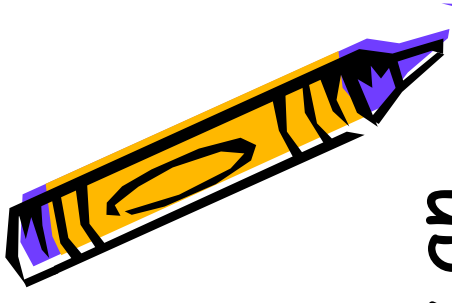
- Withdrawal symptoms
- Low birth rate
- Sleeping problems
- Excessive crying
- High risk of SIDS
- Respiratory problems
- Learning disabilities
- Behavioral Problems
- Hyperactivity/Inattention
- Birth defect



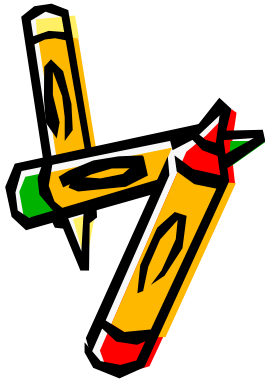
- Although infants born to mothers taking methadone may show some signs of dependence on the drug, they can be safely treated in the nursery and generally do far better than babies born to women who continue to use heroin.

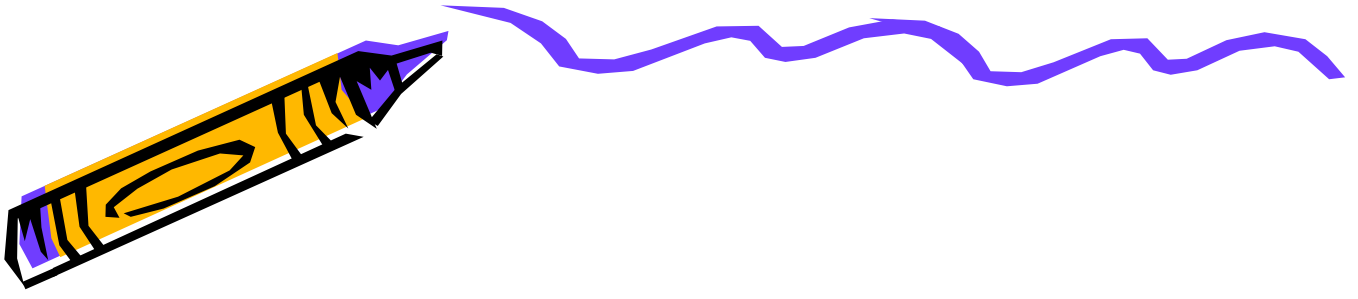
[http://corp.aadac.com/other\\_drugs/the\\_basics\\_about\\_other\\_drugs/opioids\\_and\\_pregnancy\\_beyond\\_abcs.asp](http://corp.aadac.com/other_drugs/the_basics_about_other_drugs/opioids_and_pregnancy_beyond_abcs.asp)






Socioeconomic factors also may play an important role in a child's outlook.





ALCOHOL

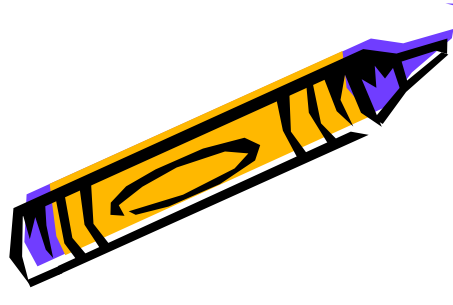




What you drink, baby drinks too.  
Legally intoxicated is defined as a Blood Alcohol Level of .08%. A 100 lb (45 kg) female consuming 5 standard drinks will reach a BAL of .25% - three times the legal limit. BAL reduces .01% per hour.

A drink equals a 12 oz. regular beer, 1 oz. shot of 100 proof liquor, 1.5 oz. shot of 80 proof liquor, or 4 oz. glass of regular table wine.

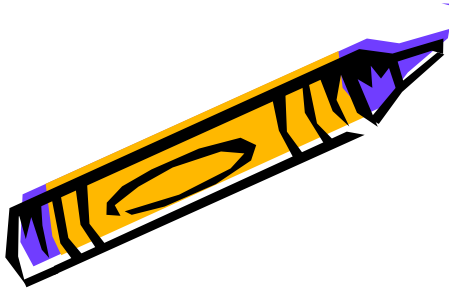




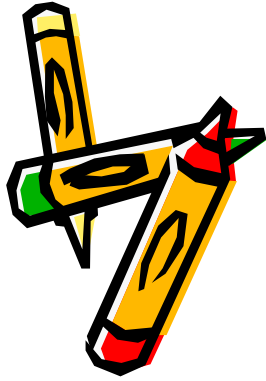
- The Statistics Canada, Canadian Community Health Survey, 2000/01 found that:
  - 6.8% of girls ages 12 to 14
  - 19.8% of girls age 12 to 19
  - 26.0% of girls ages 20 to 24
  - 19.9% of girls ages 20 to 34 consumed 5 or more drinks on each occasion 12 or more times per year



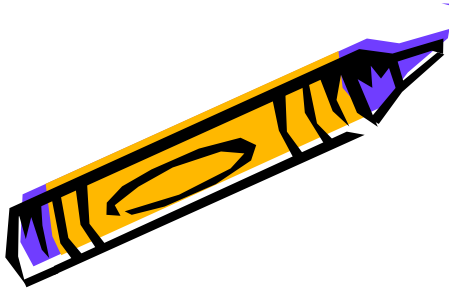
- An additional:
- 32.2% of girls ages 15 to 34
- 13.8% of girls ages 12 to 14 consumed 5 or more drinks on each occasion 1 to 11 times per year.



- Most girls are 2 to 3 months pregnant before they find out. Given the prime childbearing age range, the odds are very high that about 20% of babies have been exposed to multiple binges in high levels of alcohol in the first trimester, before the girl even knew she was pregnant. It is Party Hearty Time. The vast majority of these girls are NOT alcoholics. Maternal prenatal alcohol consumption even at low levels is adversely related to child behavior. The effect was observed at average exposure levels as low as 1 drink per week.

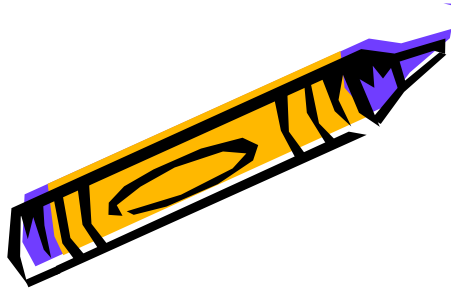


- The Canadian Pediatric Society states: "Fetal alcohol syndrome (FAS) is a common yet under-recognized condition resulting from maternal consumption



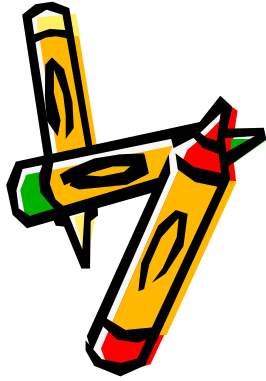
# Warnings

- Doctors have warned for decades that women who consume large amounts of alcohol during pregnancy can affect their child's mental development.



## Old advice

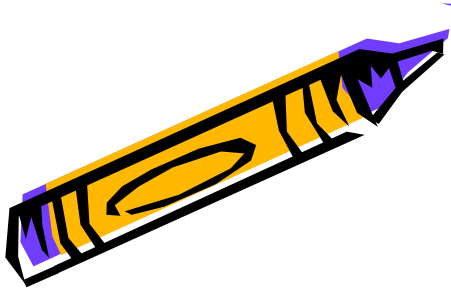
- The Department of Health (DoH) advises pregnant women to limit their alcohol to one or two glasses of wine a week. Its figures show 61% of women drink while pregnant.



# New advice

- The new research suggests even moderate alcohol consumption makes a baby  $3\frac{1}{2}$  times more likely to suffer from abnormal spasms in the womb. The findings, by Peter Hepper, a professor at Belfast University's fetal behavior research unit, appear to back the view that there is no safe level of alcohol consumption during pregnancy.



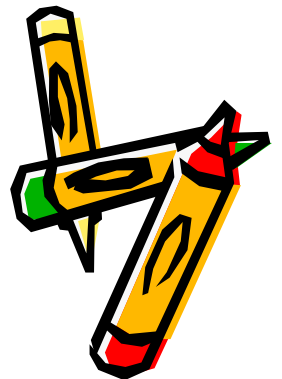
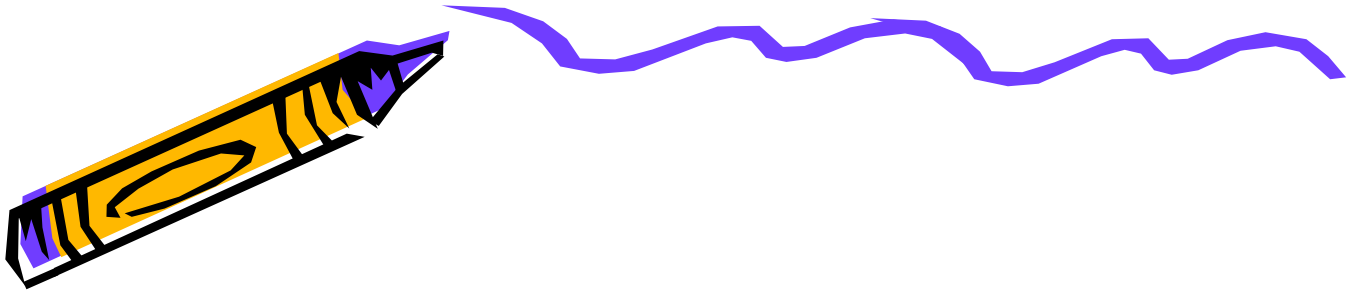


- The Sunday Times - Britain
- The Sunday Times November 20, 2005
- Twitches that indicate alcohol may hurt baby  
Jonathon Carr-Brown and Martyn Halle  
[Click here to watch video](#)

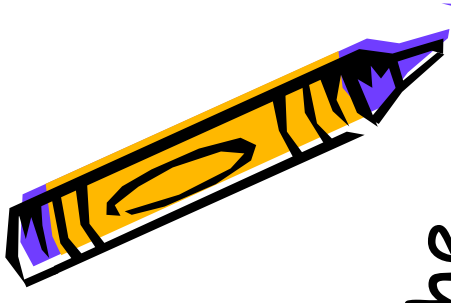
SCIENTISTS have captured graphic images of the damage done to unborn babies as a result of women drinking during pregnancy.

- Just one glass of wine a week can make babies "jump" in the womb throughout a nine-month pregnancy. Experts believe this abnormal hyperactive behaviour is the result of alcohol slowing or retarding the formation of the central nervous system.

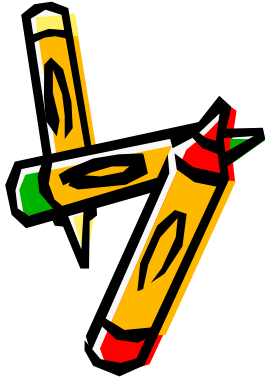




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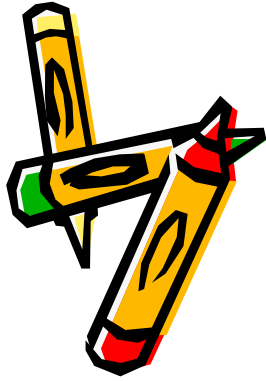
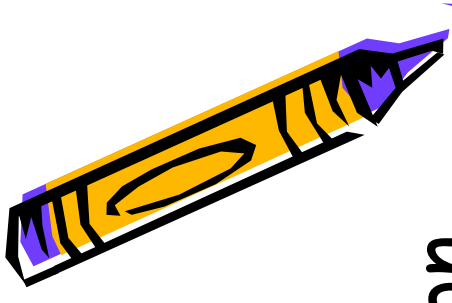


- Alcohol use causes withdrawal in the baby, as well as a group of problems including birth defects called fetal alcohol spectrum disorder (FASD).

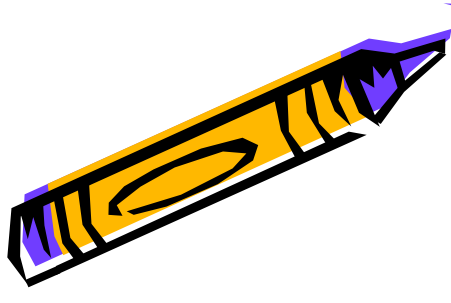


# FASD

- Leading cause of mental retardation and birth defects.
- FASD is a life long disability.

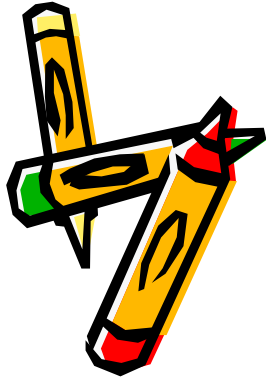


- Babies are born very tiny and stay quite small and may not develop as quickly
- Altered facial features





- Central nervous system damage might include small brain or head circumference, brain malformations, developmental delay, intellectual impairment, developmental disorders, learning disabilities, attention deficit/hyperactivity, and poor judgment and reasoning



Normal brain of baby 6 wks old

Brain of baby same age ago with FAS

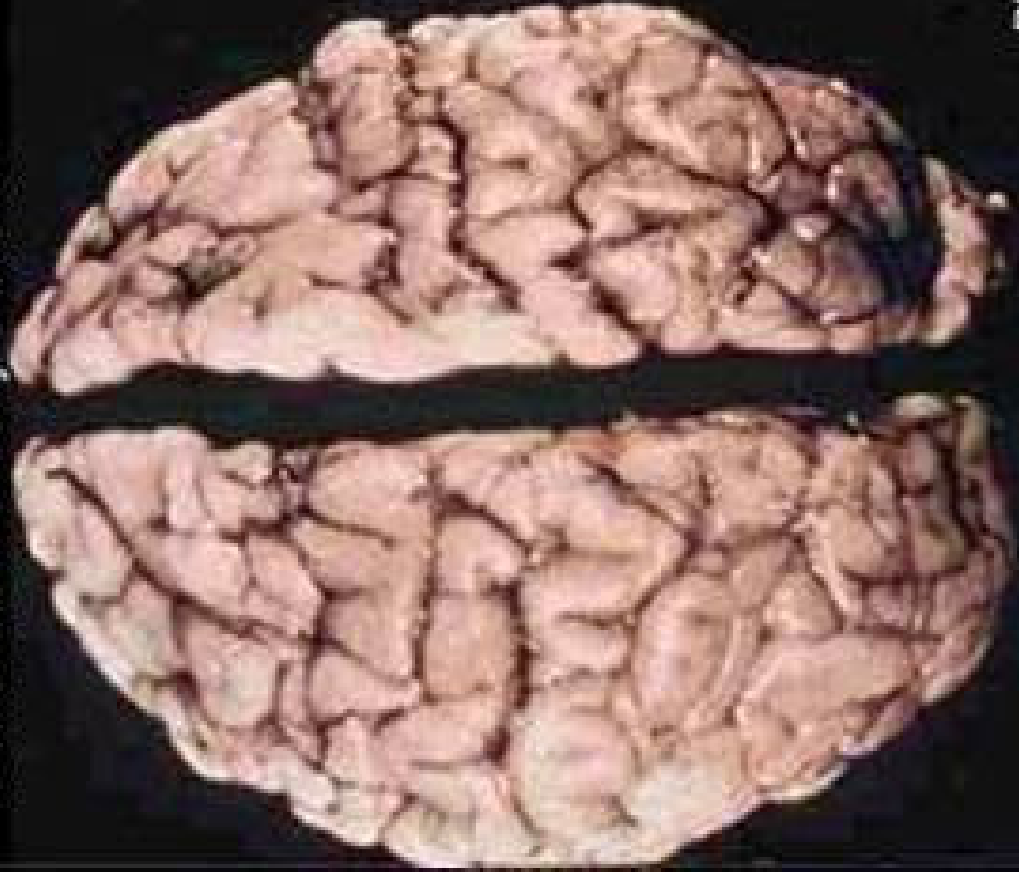
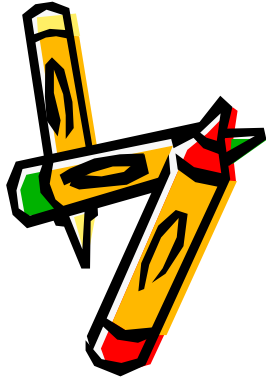
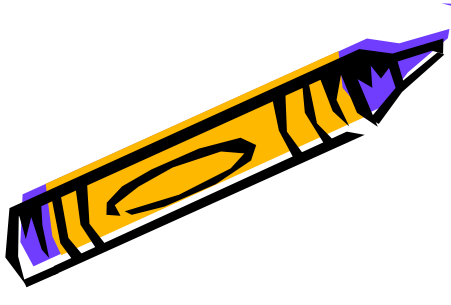


Photo courtesy of Sterling Clarrren MD



# Alcohol effects to child

- Behavioral and cognitive problems which lead to:
- Trouble in school
- Trouble with the law



## NEW STUDY

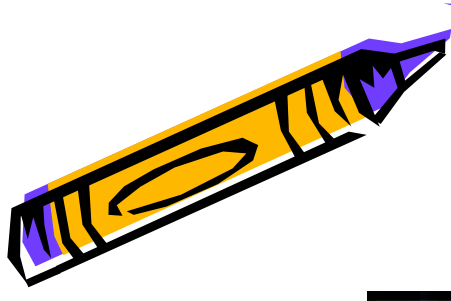
### BINGE DRINKING BY MOTHER HURTS FETAL BRAIN !!!


- A single drinking binge by a pregnant woman can be enough to permanently damage the brain of her unborn child.

(January 2000 issue of the journal of Science.)



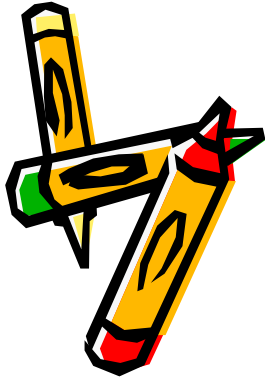
# Prescription Drugs.

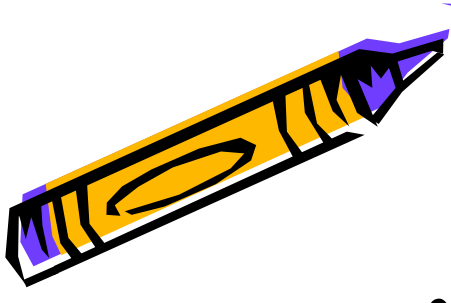




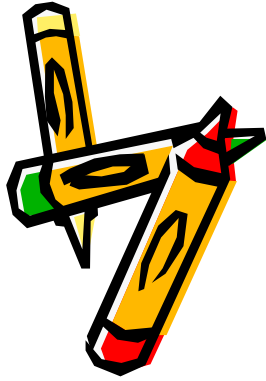
- Pregnancy, whether planned or a pleasant surprise, brings with it important concerns about prescription and over the counter drugs.

- Not every medication poses a risk to the unborn baby. However, some do..





- Women should discuss the relative risks and benefits of any prescribed drug therapy and NOT take over-the-counter drugs or naturopathic remedies without first consulting a physician.

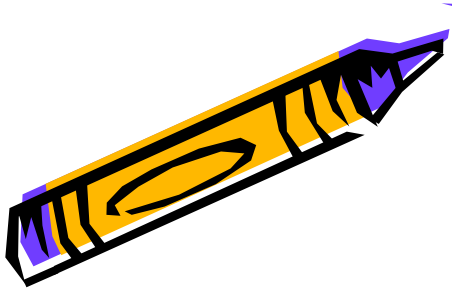


# Teratogenics

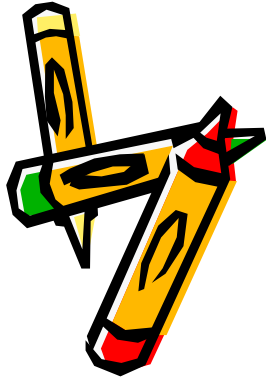
- The drugs which were of concern, and have been proved to be teratogenic, included alcohol, alkylating and antimetabolite agents, stilboestrol, disulfiram, heparin, lithium carbonate, phenytoin, tretinoin (retinoic acid), troxidone and valproic acid.

(Division of Clinical Pharmacology and Toxicology, Hospital for Sick Children, Toronto, Canada.)



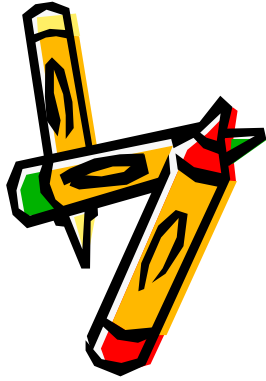


- **Commonly Abused Prescription Drugs:**
- **Opioids:** These drugs are prescribed to treat pain and are sometimes used as a pre-anesthetic sedative. Common names include morphine, codeine, hydrocodone (Vicodin), meperidine (Demerol) and oxycodone (OxyContin).

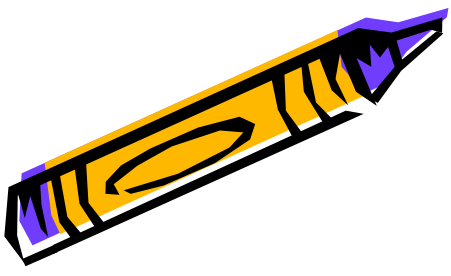


# Over the counter

- Over-the-Counter Drugs such as antacids, laxatives, cold medications, anti-nausea drugs, pain medications, etc. should not be taken without checking with a health care professional while pregnant.

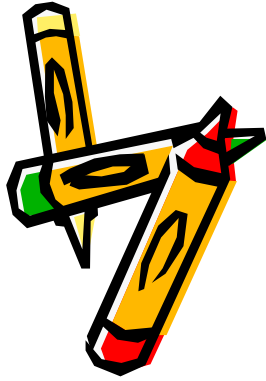


methamphetamine,



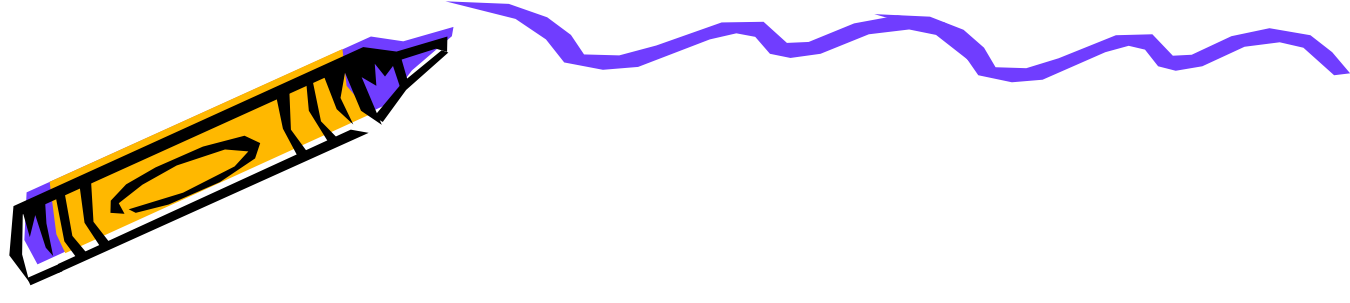


- Amphetamines ("uppers," "bennies," "pep pills") are artificial stimulants. They are closely related to dextroamphetamines ("dexies"), methamphetamines ("speed," "crystal," "meth," "crank"), and smokable methamphetamine ("ice"). They all have similar effects.

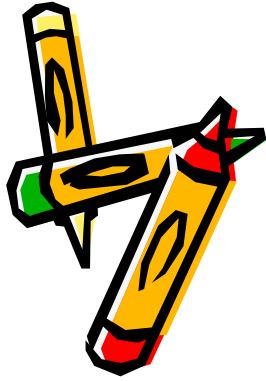
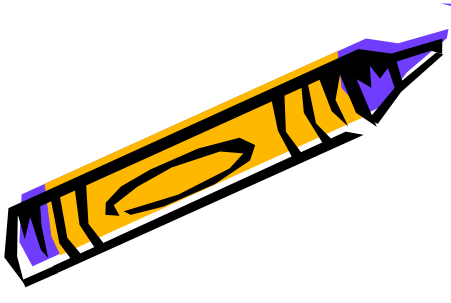


Also known as

Speed, Ice, Crank and **Crystal meth.**



- After birth, babies who were exposed to amphetamines appear to undergo withdrawal-like symptoms, including jitteriness, drowsiness and breathing problems.



- Babies may experience learning disabilities, growth and developmental delays
- May be born with gastroschisis, a condition when the baby is born with a hole in the abdomen causing the intestines to be outside of the body; and
- May cause an increased risk of birth defects, including; cleft palate and heart and limb defects.

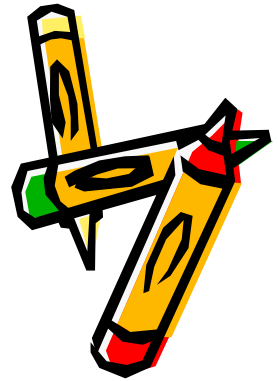
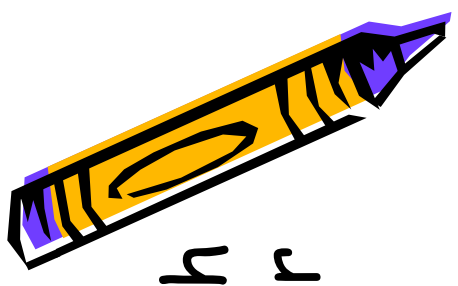


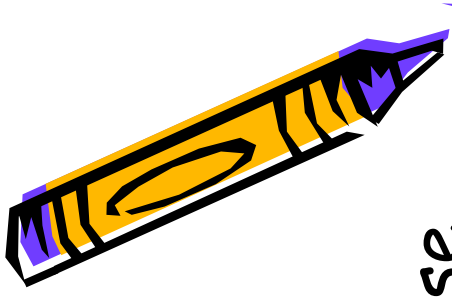
- It also appears to contribute to pregnancy complications including maternal high blood pressure which can slow fetal growth and causes other complications for mother and baby), premature delivery, and excessive bleeding in the mother following delivery.

<http://home.earthlink.net/~seedsoflove/id8.html>

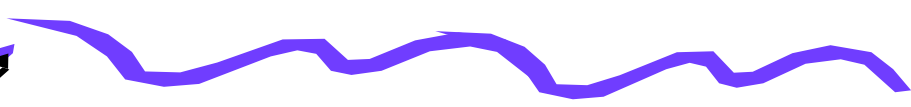
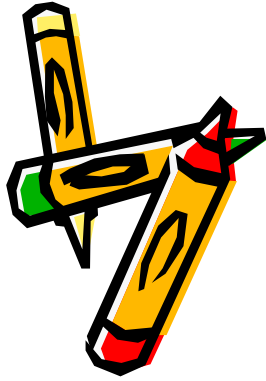


- Some babies may even be born with clubfeet, and some without arms or legs.





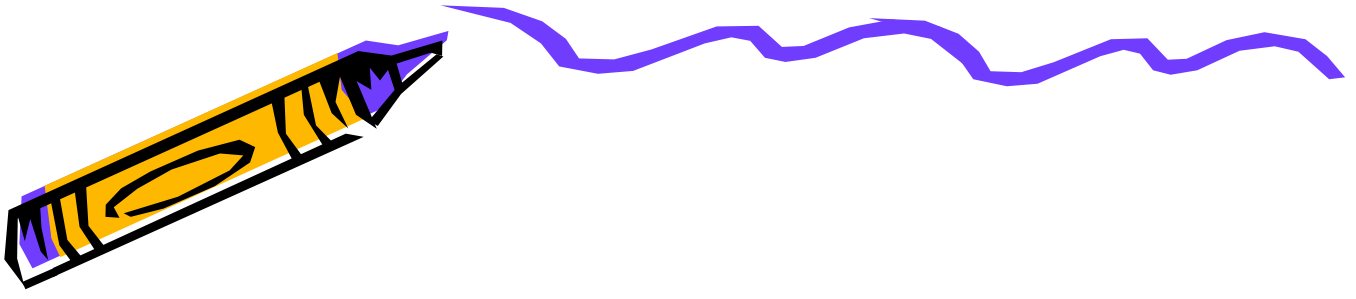
- Full term babies born to mothers who use methamphetamine will likely have difficulty sucking and swallowing.
- Babies often cannot tolerate stimuli such as human touch and light.
- Display tremors and coordination problems.



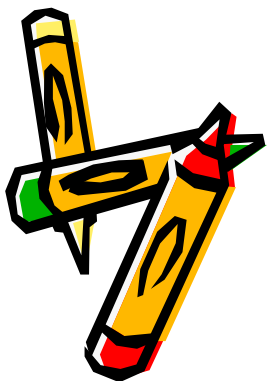
# Long term effects

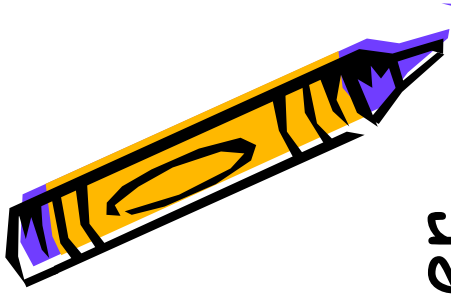
- May last for many years.
- School-aged children are more likely to be hyperactive, have learning disabilities and unprovoked fits of anger.
- Some may have attention deficit disorders.



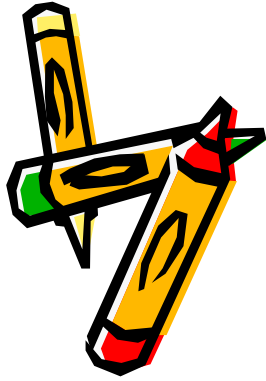


NICOTINE



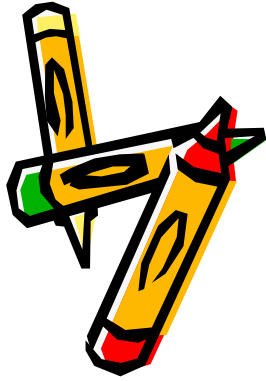


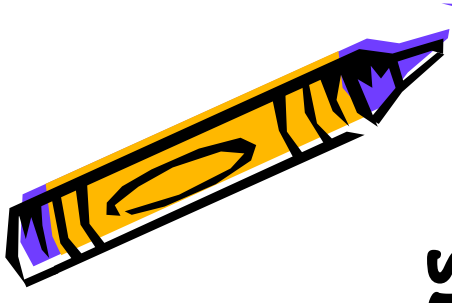
- It is no longer a question of whether the unborn will be harmed by smoking nicotine during pregnancy but of the degree, number, types, notice ability and lifetime impact of the harms actually inflicted.



## Cont:

- **NICOTINE:** Women who smoke during pregnancy have a higher percentage of stillborn babies, miscarriages, premature deliveries, and low birth weight babies. Babies are at greater risk of dying soon after birth. (Sudden Infant Death Syndrome).





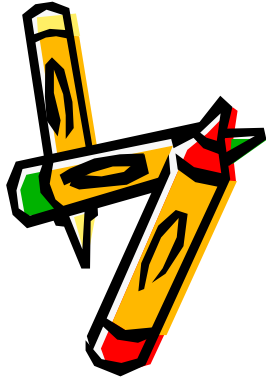
**Cont:**

- **Researchers also find tobacco has negative effects on motor development**



# Nicotine addiction

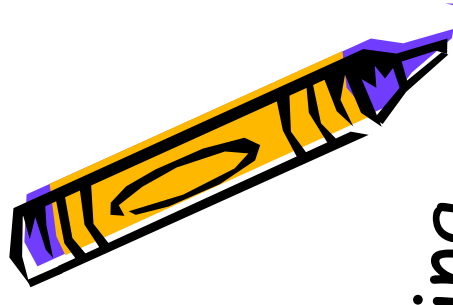
- But more important than scientific and Canadian government assertions that nicotine is more addictive than heroin or cocaine, or that your new-born's first challenge in life will be enduring nicotine withdrawal and chemical detox alone, nicotine is not only a teratogen but very likely a neuroteratogen inflicting lasting damage upon their nervous system (1991); (1998 - free full text study).

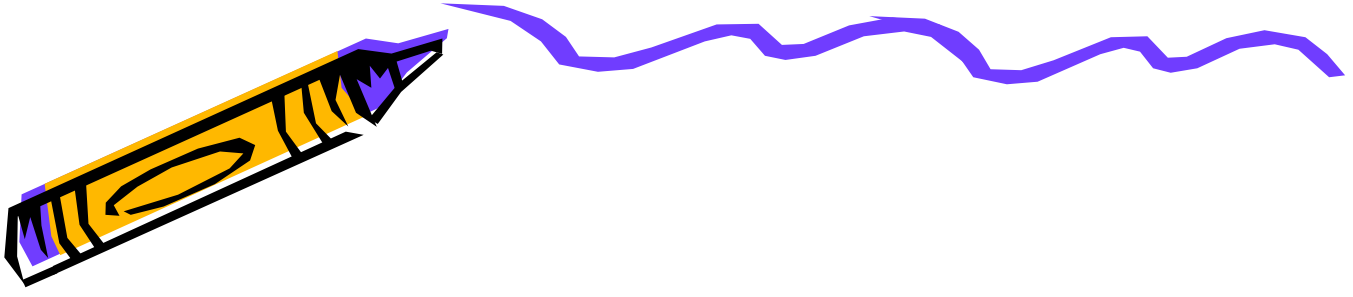


## other

- Caffeine withdrawal includes feeding difficulties, vomiting, excessive crying, irritability, and poor sleep patterns. Onset of symptoms may occur up to 5 days after birth and persist for weeks or months.

eMedicine-Neonatal Abstinence Syndrome: Jaques Belik, MD

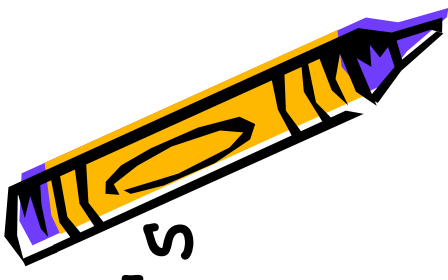




# DIAGNOSIS

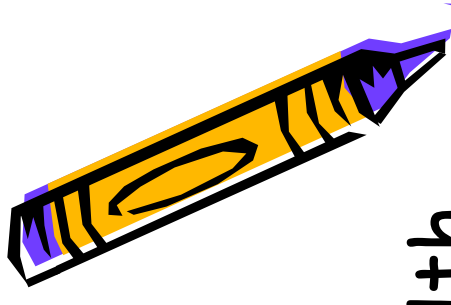


- An accurate report of the mother's drug usage is important.
- A Neonatal Abstinence scoring system may be used to help diagnose and grade severity of the withdrawal.
- Using the scoring system, points are assigned for certain signs and symptoms and the severity of each.
- This scoring may help in planning treatment.



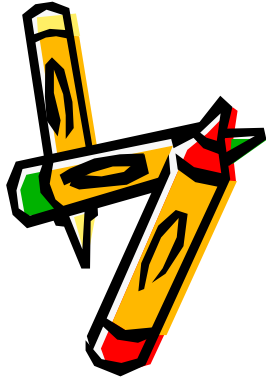
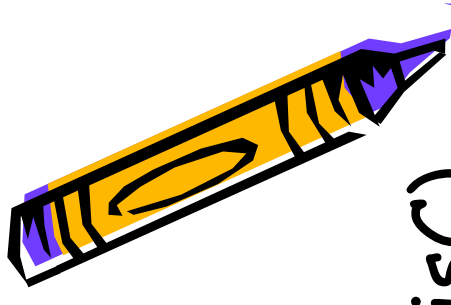
# Treatment will depend on

- Baby's gestational age, overall health, and medical history
- Extent of the disease
- Your baby's tolerance for specific medication, procedures or therapies



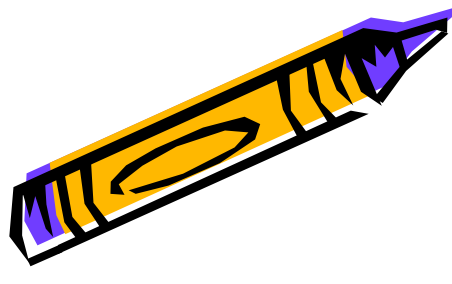
# Co-Morbidity

- Perinatal infections (HIV, HepatitisC)
- Failure to Thrive
- Diaper dermatitis (rash)
- Decreased IQ
- Learning Disability
- Behavioral and Conduct disorder



# Important things to remember

- Support pregnant women who are misusing drugs and alcohol
- Women self medicate for reasons
- Don't judge or shame
- Be a friend and create positive change

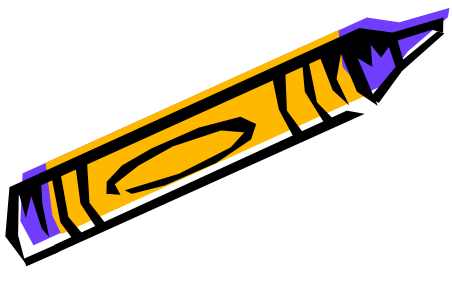


# When I see Sapphire

- When I see Sapphire smiling ear to ear, I look at the world in a whole new way, and the important things become clear







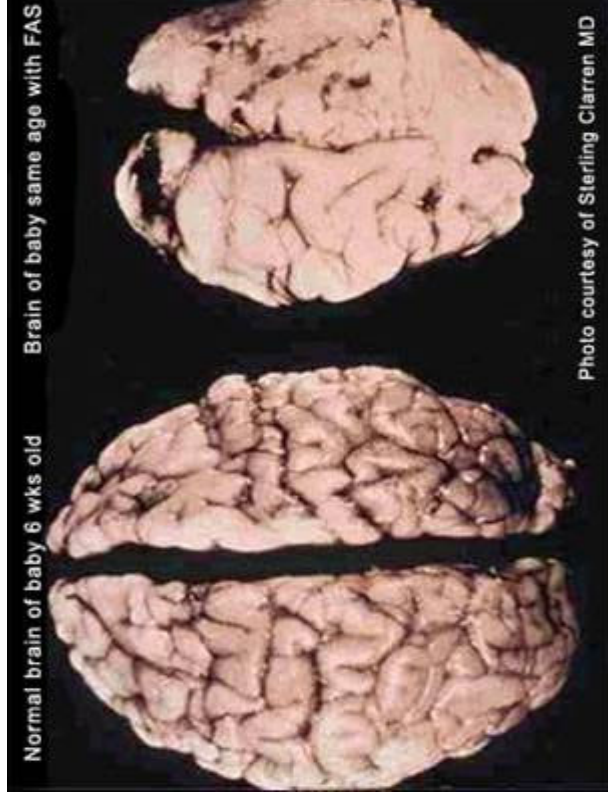
# FASD

## Leading cause of mental retardation in western Canada



# Cont:

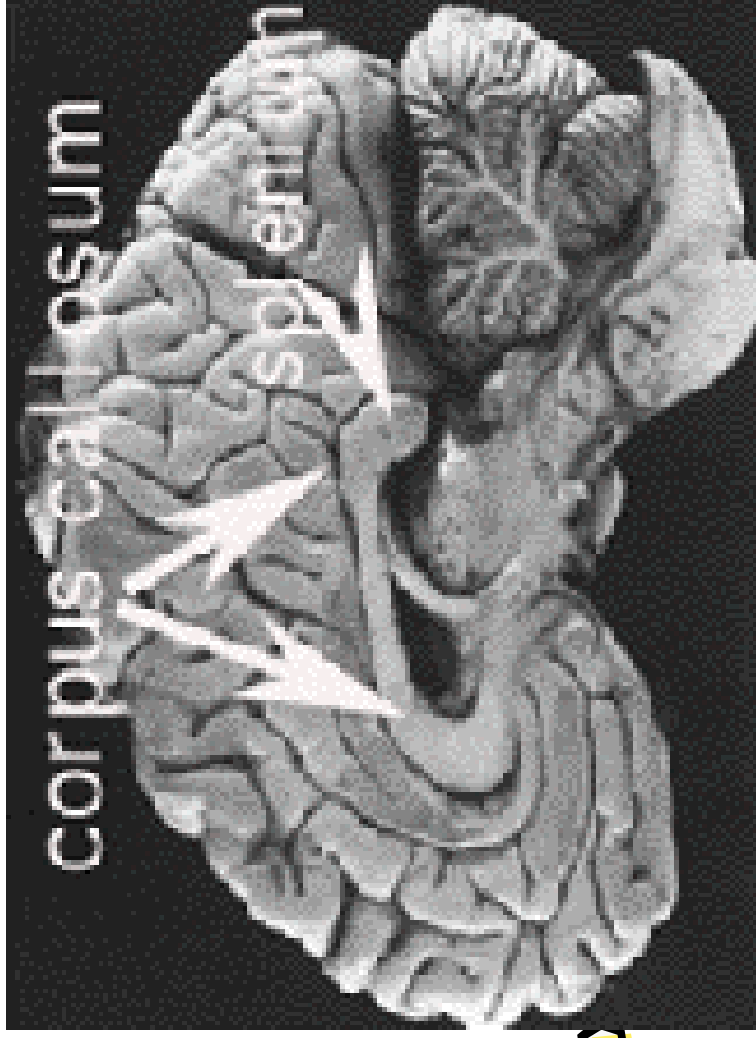
- Dozens of different kinds of cells are organized into specialized groups called tissues.
- Different tissue types are assembled into organs, which are structures specialized to perform particular functions.
- Examples of organs include the heart, stomach, and brain. Organs, in turn, are organized into systems such as the circulatory, digestive, or nervous systems. All together, these assembled organ systems form the human body



# Corpus Collosum

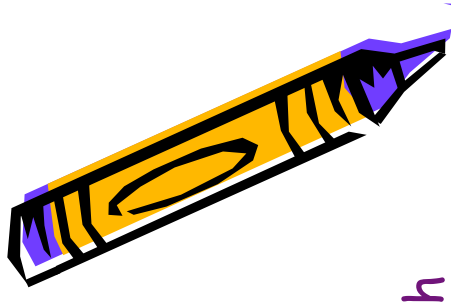
A band of nerve fibers that forms the major communication link between the right and left halves of the brain.

Some FAS children may lack a corpus callosum, an incidence rate 20 times higher than that in the general population



# FASD and the Brain

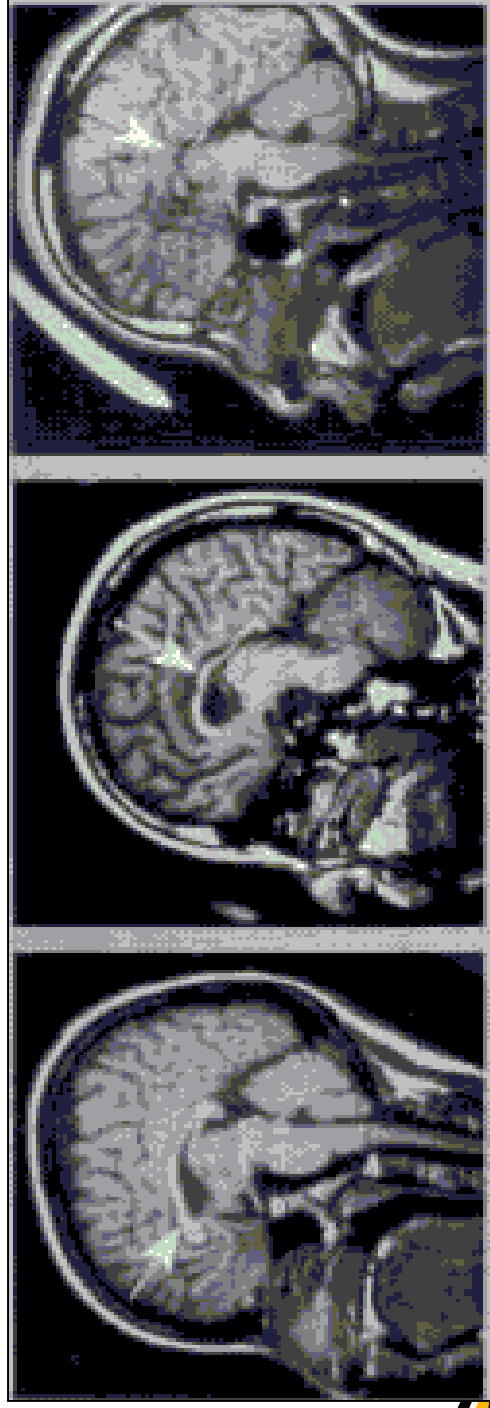
These two images are of the brain of a 9-year-old girl with FAS. She has agenesis of the corpus callosum, and the large dark area in the back of her brain above the cerebellum is essentially empty space.



A. Magnetic resonance imaging showing the side view of a 14-year-old control subject with a normal corpus callosum; B. 12-year-old with FAS and a thin corpus callosum; C. 14-year-old with FAS and agenesis (absence due to abnormal development) of the corpus callosum.

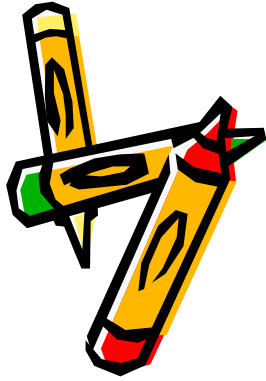
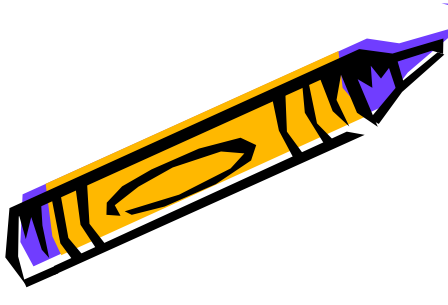
**Source:** Mattson, S.N.; Jernigan, T.L.; and Riley, E.P. 1994. MRI and prenatal alcohol exposure: Images provide insight into FAS.

*Alcohol Health & Research World*



# Damage to Prefrontal Cortex causes difficulty in:

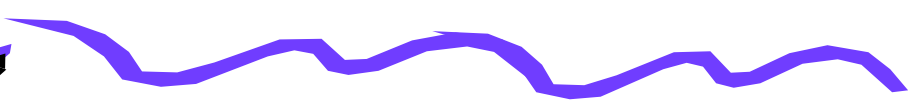
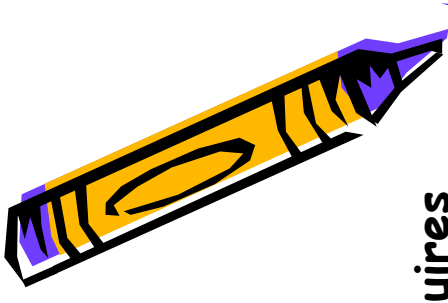
- inhibition
- problem solving
- sexual urges
- planning
- time perception
- socially inappropriate behavior, as if inebriated
- inability to figure out solutions spontaneously
- inability to control sexual impulses, esp. in social situations
- inability to apply consequences from past actions
- difficulty with abstract concepts or time and money



- internal ordering
- working memory
- self-monitoring
- verbal self-regulation
- motor control
- regulation of emotion
- motivation



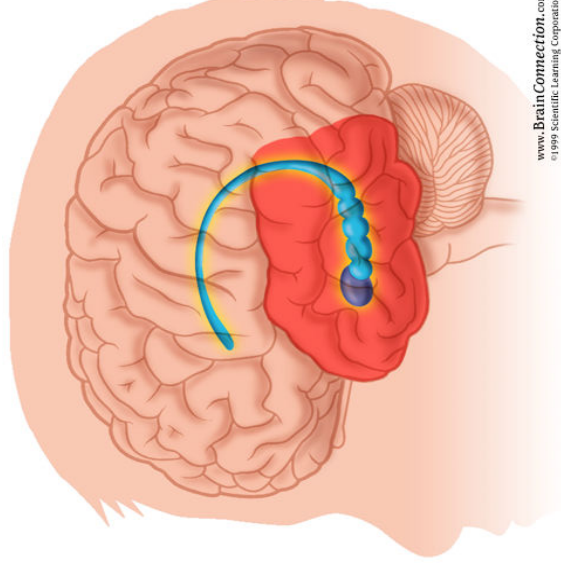
- = like files out of order, difficulty processing information
- = storing and/or retrieving information
- = needs frequent cues, requires policing by others
- = needs to talk to self out loud, needs feedback
- = fine motor skills more affected than gross motor
- = moody roller-coaster emotions, exaggerated
- = apparent lack of remorse, need external motivators



# Hippocampus

Stores and processes memories:

- Helps find memories
- Affects emotions
- Helps to encode memories



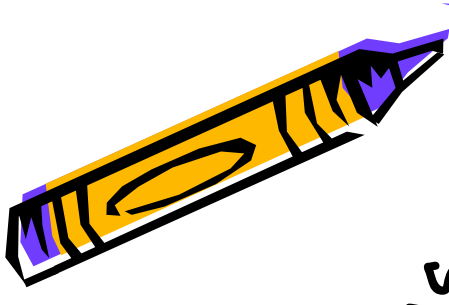
www.BrainConnection.com  
©1999 Scientific Learning Corporation



# Hypothalamus

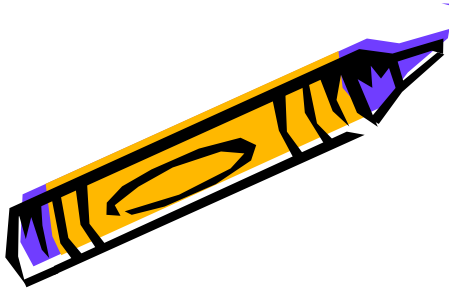
- Important in maintaining the body's internal environment. It regulates sleep, food intake, body temperature, hormones, and controls pituitary pineal and endocrine glands.

Hormonal communication systems augment the nervous communication systems within the body.

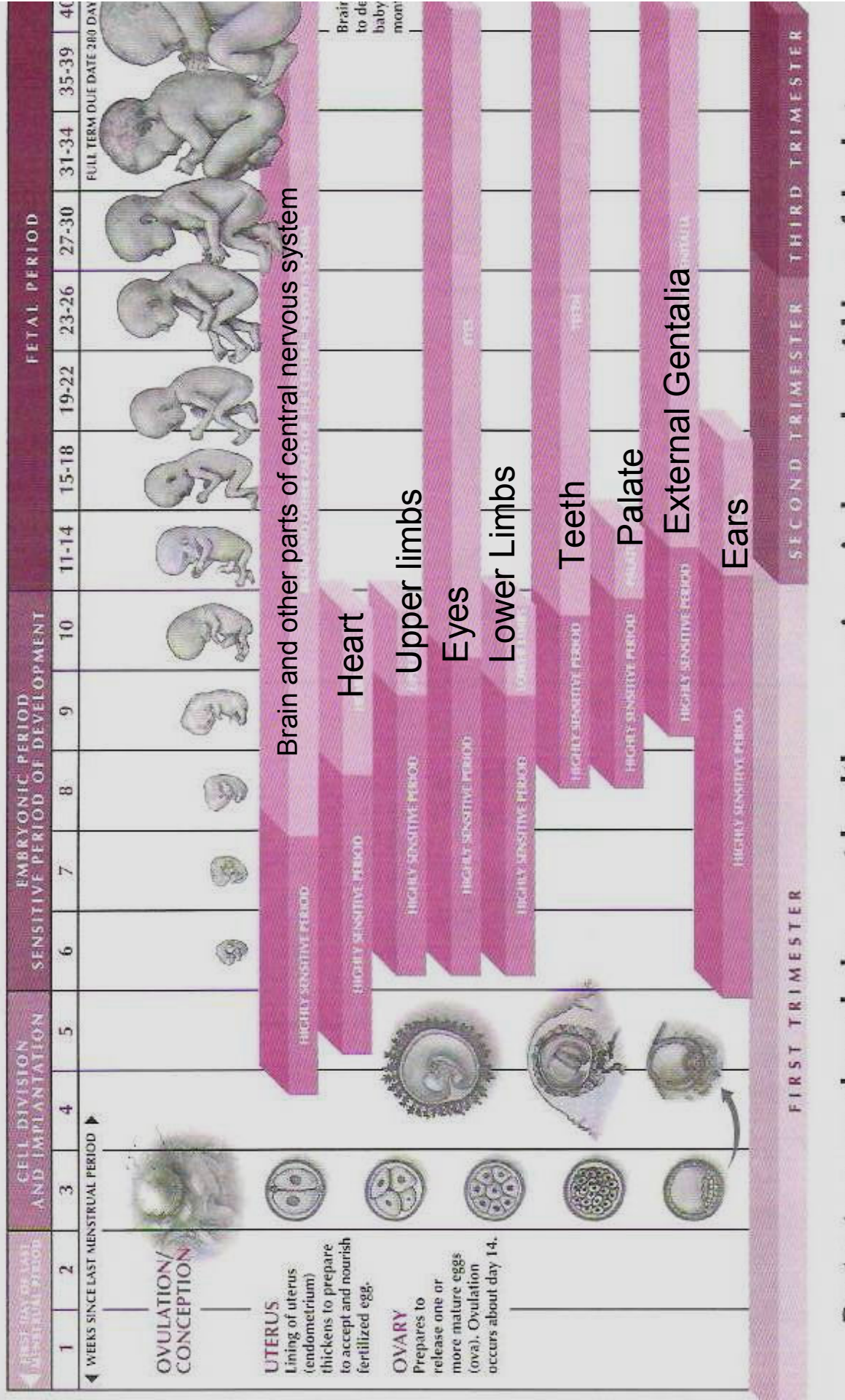


# Associated Cognitive Features:

- Memory problems
- Inconsistent performance
- Impulsivity
- Distractibility
- Disorganization
- Slow auditory pace
- Developmental lags, cognitive processing deficits

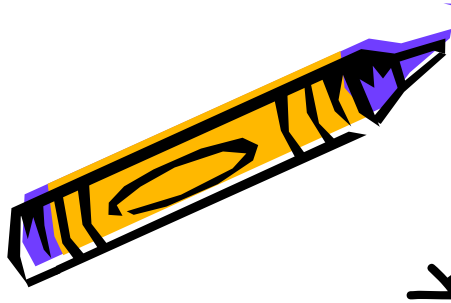


# Fetal Development



# Teenage Pregnancy

- Babies born to teenagers who drink heavily are at double the risk. Since the teenager herself is a growing individual, her body needs nutrients for her own growth. The unborn child also needs nutrients for development. In a teenage pregnancy, both mother and the baby are at risk.



# Teenage pregnancy

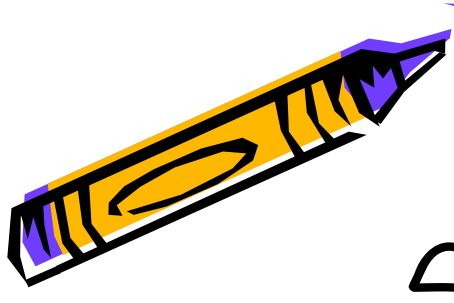
- The mother puts additional stress on her body and the baby has an increased chance of being born too small or too soon. If the fetus is also subjected to alcohol it may suffer some characteristics of FAS at birth.



# What do you think?

Who is at more risk of having a FASD child?

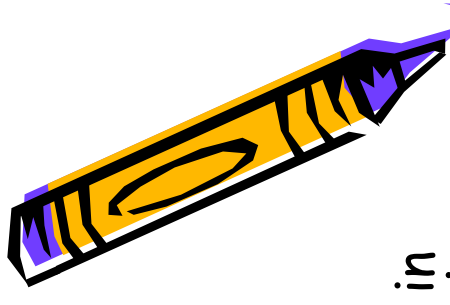
- A) women who make over \$50,000 a year
- B) college students
- C) women of lower economic class



# FACTS

- A single exposure to high levels of ethanol (the alcohol in beer, wine and spirits) can kill nerve cells in the developing brain.
- Women who reported consuming 10 or more drinks per week at the time of conception were almost three times as likely to experience a miscarriage as women who had not consumed any alcoholic beverage during the conception period. The partners of men who consumed 10 or more alcoholic drinks per week at the time of conception were five times as likely to miscarry as women whose partners did not drink any alcohol, according to the researchers.

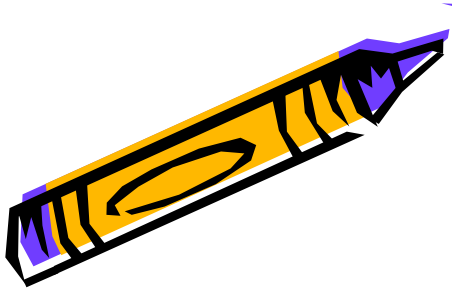
- Posted by **fasstar** at 01:06 AM CST



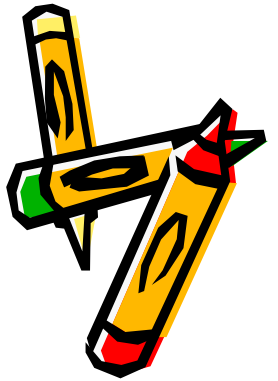
# Alcohol and Male Reproduction

- Alcohol is a direct testicular toxin.
- Causes significant detonation in sperm concentration, sperm output, and motility.
- Causes morphological abnormalities in sperm.
- 80% of chronic alcoholic men are ~~sterile~~ common causes of male sterility.



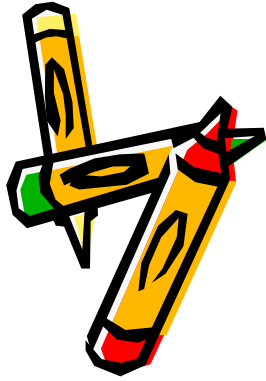
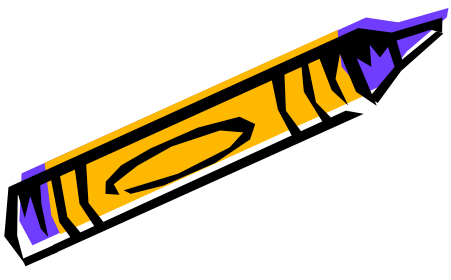


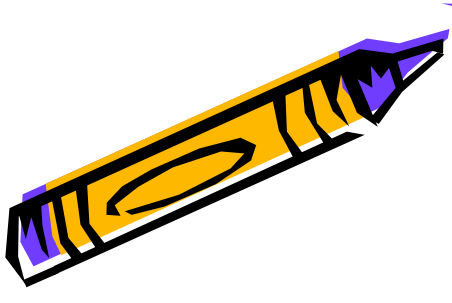
What can we do in the  
Classroom?



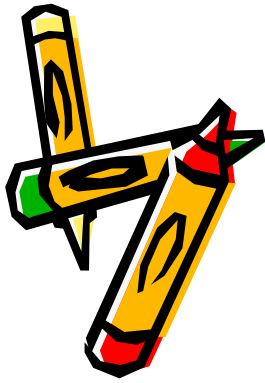
# Classroom Strategies

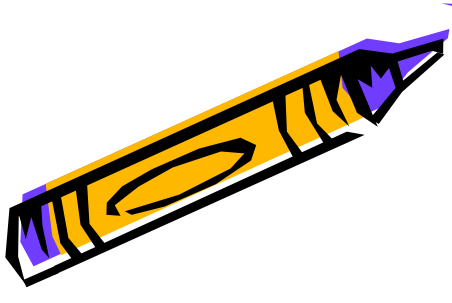
- Work with developmental age not chronological age.
- Repeat, repeat, repeat, re-teach. Adapt the curriculum expectations.
- Look for the cues that create outburst in child and steer them away from them.
- Alternate times of calm with activity, mini breaks for “Brain gym” activities could be helpful.





- Reduce stimuli in classroom.
- Use a ruler or paper to cover everything except what is being read at that moment.
- Low stimuli.
- Clothing that irritate.
- Build on functional skills.
- Hands on learning.



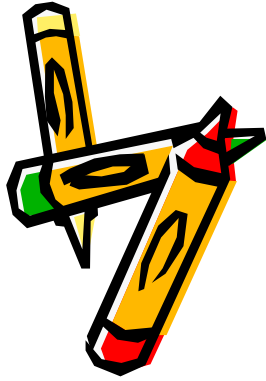


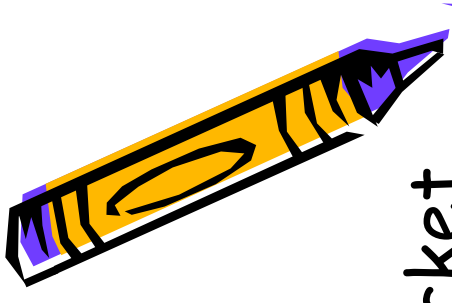
- Smaller class size (if possible)
- Prepare for transitions- forewarn, auditory cue (same song) visual cue (coat) action cue (hold coat open)
- Personal boundaries, example a carpet square to help recognize personal space
- Allow lots of time to process information



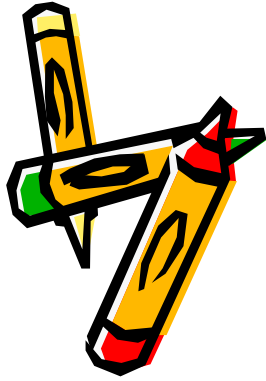


- Use one book per lesson. Use color coded books for each lesson. Eg: get your yellow book out instead of saying language art book.
- Quiet time: Not to be used as punishment
- Minimize homework.



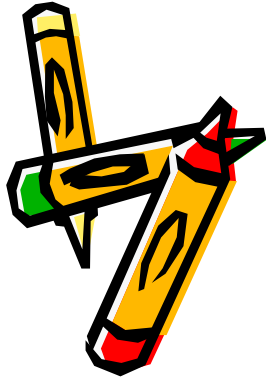


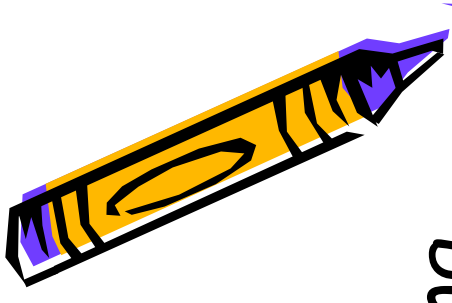
- Allow fiddle toys, e.g., squishy balls, pocket full of rubber bands, chewing gum.
- Ask to repeat simple directions to make sure they understood. Avoid multiple commands.
- Be firm, and give limited choices.
- Think brain not blame.





- Communication, patience, compassion, understanding and creativity do work. Think FASD First.
- Focus on life skill training, health and nutrition, job skills, communication, problem-solving, social and life skills not higher academics.
- Incorporate math and literacy skills into life skills, eg. Cooking, shopping, advertising etc.





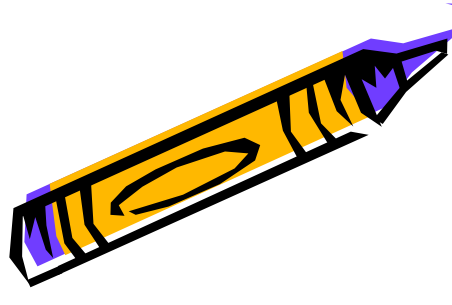
- If what you are doing is not working, don't try harder, try differently?

Diane Malbin



# Resources

- <http://cocaine.org/crackbaby/cocaine-babies.html>
- Fetal nicotine or cocaine exposure:  
which one is worse?  
By Slotkin TA
- Department of Pharmacology and Cancer Biology,  
Duke University Medical Center,  
Durham, North Carolina, USA.
- *J Pharmacol Exp Ther* 1998 Jun; 285(3):931-45  
[http://www.marchofdimes.com/professionals/14332\\_1169.asp](http://www.marchofdimes.com/professionals/14332_1169.asp)
- <http://www.emedicine.com/ped/topic2760.htm> Article by  
Jaques Belik, MD



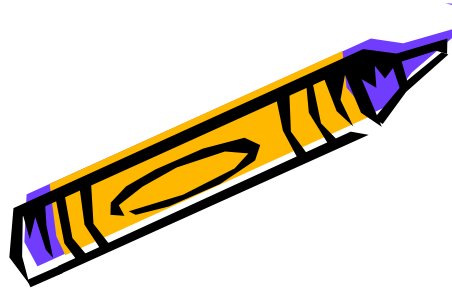
# Resources

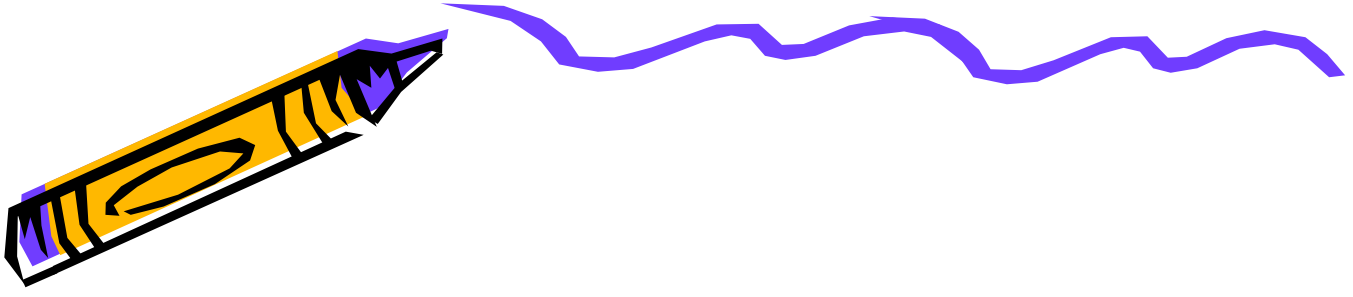
- <http://www.americanpregnancy.org/pregnancyhealth/abusingprescriptiondrugs.html>
- [http://corp.aadac.com/for\\_women/the\\_basics\\_about\\_women/women\\_brochures\\_alcohol\\_other\\_drugs.asp](http://corp.aadac.com/for_women/the_basics_about_women/women_brochures_alcohol_other_drugs.asp)
- March of Dimes:  
[http://www.marchofdimes.com/professionals/14332\\_1169.asp](http://www.marchofdimes.com/professionals/14332_1169.asp)
- Fetal Alcohol Syndrome, National Health Video, INC. 12021 Wilshire boulevard, Suite 550 Los Angeles, California 90025, Tel: 1-800-543-6803- Fax: 310-477-8198. email: healthvid@aol.com.
- FASD Tool Kit: Ontario Federation of Indian Friendship Centres.
- Diane Malbin: Concurrent Session 3e: Educational/Vocational Issues. "When good Techniques Don't Work: Trying differently Rather than Harder".
- Alberta Learning, Learning and Teaching Resources Branch. Edmonton , AB



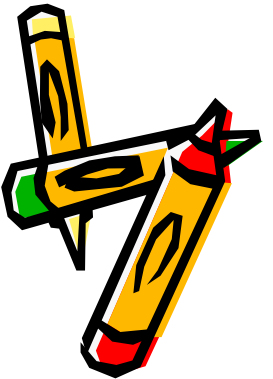
# Resources

- One hit of crystal meth causes birth defects: U of T study: Peter Wells [pg.wells@utoronto.ca](mailto:pg.wells@utoronto.ca). University of Toronto.
- [http://www.eurekalert.org/pub\\_releases/2005-07/uot-oho072605.php](http://www.eurekalert.org/pub_releases/2005-07/uot-oho072605.php)
- W.R Spence. MD; 1993 HEALTH ED CO, A Division WRS Group, INC, Waco, TX 76702-1207

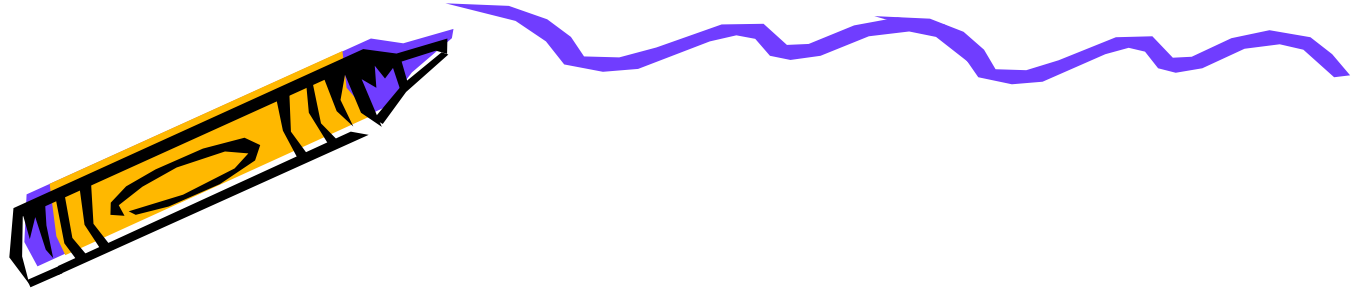




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