Basic Math Review Worksheet

Basic Conversions Review:

100 mg = _____ g
500 mg = _____ g
300 mcg = _____ mg
10 oz = _____ ml
12 tsp = _____ mL
2 kg = _____ lb
5,000 g = _____ mcg
250 mcg = _____ mg
10 mg = _____ mcg
0.001 mg = _____ mcg
9 tsp = _____ tb

0.1 g = _____ mg
12 kg = _____ lb
6 oz = _____ mL
600 mg = _____ g
10 mcg = _____ mg
1,500 mcg = _____ g
8 tsp = _____ mL
102 F = _____ C
0.2 g = _____ mg
38.7 C = _____ F

1 oz = _____ mL
1 L = _____ mL
0.6 mg = _____ mcg
0.015 g = _____ mg
90 mL = _____ tbs
2,100 g = _____ kg
30 kg = _____ lb
8.4 lb = _____ kg
60 mL = _____ oz
150 lb = _____ kg

Story Problems:

1. A health care provider (HCP) orders carbamazepine (Tegretol) 0.2 g tabs orally TID for a client with an onset of new seizures.

Available from pharmacy: carbamazepine (Tegretol) 100 mg tabs

A nurse will administer how many tablets per dose? _____

How many milligrams will the client receive in 24 hours? _____

2. A health care provider (HCP) orders hydrochlorothiazide 12.5 mg orally TID

Available from pharmacy: hydrochlorothiazide 25 mg scored tablets

A nurse will administer how many tablets per dose? _____

How many milligrams will the client receive in 24 hours? _____

3. A health care provider (HCP) orders digoxin (Lanoxin) 375 mcg orally once a day.

Available from pharmacy: digoxin (Lanoxin) 0.25 mg scored tablets.

A nurse will administer how many tablets per dose? _____

4. A health care provider orders linezolid (Zyvox) 0.6 g orally q12h

    Available from pharmacy: linezolid (Zyvox) oral suspension 100 mg per 5 mL

    A nurse will administer how many milliliters per dose? _____ _____

    If the container holds 600 mL, how many doses are in the bottle? _____

5. A health care provider orders valproic acid (Depakene) 150 mg orally BID

    Available from pharmacy: valproic acid (Depakene) oral suspension 250 mg per 5 mL

    A nurse will administer how many milliliters per dose? _____

    If the container holds 180 mL, how many doses are in the bottle? _____

6. A health care provider orders ketorolac (Toradol) 25 mg IM q6h prn for severe pain

    Available from pharmacy: ketorolac 15 mg/mL

    A nurse will administer how many milliliters per dose? _____

7. A healthcare provider orders ondansetron (Zofran) 3 mg slow IV push X 1 dose stat.

    Available from pharmacy: ondansetron (Zofran) 4 mg/2 mL single dose vial

    A nurse will administer how many milliliters of ondansetron per dose? ____ _____

8. A health care provider orders a client with psoriasis hydrocortisone cream 2%

    (2 g/100 mL) topical ointment. The client is to apply 100 mg (1 applicator full) to the right elbow BID and cover with an occlusive dressing.

    How many milliliters does the client administer per dose? _____

9. A health care provider orders heparin 6,000 units subcut q12h. Available from

    pharmacy: heparin 10,000 units/mL vial

    A nurse will administer how many milliliters per dose? _____

10. A health care provider orders enoxaparin sodium (Lovenox) 65 mg subcut q12h

    Available from pharmacy: enoxaparin sodium (Lovenox) 40 mg/0.4 mL syringe

    A nurse will administer how many milliliters per dose? _____ _____

11. A health care provider orders Novolin R (regular U-100 insulin) 21 units with Novolin N NPH U-100) 15 units subcut stat.

    A nurse will administer how many total units of insulin? _____

12. A health care provider orders Humulin R (regular U-100 insulin) 16 units with Humulin N (NPH U-100 insulin) 42 units subcut stat

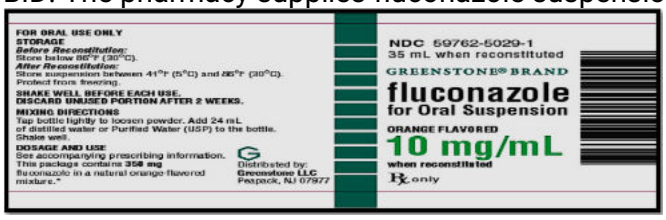
    A nurse will administer how many total units of insulin? _____ _____

13. A healthcare provider orders methylprednisolone sodium succinate (Solu-Medrol) 175 mg slow IV push daily. The pharmacy sends a 500 mg vial of powdered medication for reconstitution with the following mixing directions: Reconstitute with 8 mL of Bacteriostatic Water for injection with Benzyl Alcohol. Mix well. The resulting concentration is 500 mg per 8 mL.

    A nurse will administer how many milliliters per dose? _____ _____

14. Read the label below and use it to answer the following question:

    A prescriber orders a client with pneumonia to receive fluconazole 50 mg orally BID. The pharmacy supplies fluconazole suspension. See Label Below:



    How many milliliters of diluent should be added? _____

    After reconstitution, how many milligrams are in one milliliter? _____

    How many milliliters will a nurse administer per dose? _____

    How many milligrams will the client receive in 24 hours? _____

    If the bottle contains 35 mL, how many total doses are available?

15. A diabetic client is to receive mealtime coverage for carbohydrate intake with Regular insulin subcutaneously. The client's insulin to carbohydrate ratio is 1:12. The client consumed 72 grams of carbohydrates at their meal.
How many units of regular insulin should a nurse administer? _____

16. A type I diabetic client has the following insulin orders:
Check the client's capillary blood glucose before meals and cover with Humulin R per sliding scale orders, this dose is in addition to the regularly scheduled dose of morning insulin.

Give Humulin N (NPH U-100) 25 units and Humulin R (regular U-100) 6 units subcut with breakfast at 0800.

Sliding Scale Coverage
0 - 150 Give 0 units
151 - 175 Give 2 units
176 - 200 Give 4 units
201 - 225 Give 6 units
226 - 250 Give 8 units
> 250 Call Prescriber

The RN noted that the client's AM glucose was 202 at 0745 hrs
How many units of regular insulin should be given? _____
How much total insulin should be given? _____

17. A health care provider orders 1000 mL of 5% Dextrose in Water (D5W) to infuse over 8 hours. A nurse will set the IV pump for how many milliliters per hour? _____

18. A health care provider orders a client to receive 1500 mL of Lactated Ringers Solutions (LR) over 8 hours. How many milliliters per hour should the IV pump be programmed

by a nurse? ____ ____

19. An IV is infusing a 66 ml/hr. A nurse notes that there are 429 ml left in the IV and the time is 0915 hours. At what time in hours and minutes (use military time) will the infusion be complete? _____

20. A health care provider orders piperacillin and tazobactam (Zosyn) 1.3 g in 100 mL of 5% Dextrose in Water (D5W) IVPB to infuse in 30 minutes.
    A nurse will set the IV pump for how many milliliters per hour? _____

21. A health care provider orders 50 mL of an IVPB antibiotic solution to infuse in 30 minutes.
    A nurse will set the IV for how many milliliters per hour? ___ _____

22. A health care provider orders 5% Dextrose in Water (D5W) 1000 mL IV to infuse in 12 hours. Drop factor of the tubing is 20 gtts/mL. How many drops per minute will a nurse set the infusion? _____

23. A health care provider orders a client to receive 500 mL of blood plasma over 4 hours.
    Drop factor of the tubing is 15 gtts/mL.
    How many drops per minute will a nurse set the infusion? _____

24. A health care provider orders ampicillin 500 mg dissolved in 100 mL of 5% Dextrose in Water (D5W) to infuse in 1 hour via IVPB. Drop factor of the tubing is 10 gtts/mL
    Calculate the milliliters per hour. _____
    Calculate the drops per minute. _____ _____

25. A health care provider orders a client to receive 500 mL of 5% Dextrose and 0.45% Sodium Chloride (D5&1/2NS) to infuse over 6 hours. Drop factor of the tubing is

20 gtt/mL

Calculate the milliliters per hour. _____

Calculate drops per minute. _____

26. A health care provider orders a client to receive 0.9% Sodium Chloride (NS) 500 mL mixed with heparin 20,000 units to infuse at 1,400 units/hr

A nurse will set the IV pump for how many milliliters per hour? _____ ____

27. A health care provider orders a client to receive regular insulin to infuse at 3 units/hr

The insulin comes from pharmacy in a concentration of 100 units of regular insulin in 200 mL of 0.9% Sodium Chloride (NS).

A nurse will set the IV pump at how many milliliters per hour? ____ _____

28. A health care provider orders potassium chloride 40 mEq in 1000 mL of D5W to infuse at 2 mEq/hr.

A nurse will program the IV pump for how many milliliters per hour? ____

29. A health care provider orders lidocaine 2 g IV in 500 mL of D5W to infuse at 2 mg/min

Calculate the milliliters per hour to set the IV pump. _____ _____

30. A health care provider orders nitroglycerin 125 mg IV in 500 mL of D5W to infuse at 42 mcg/min for a client having chest pain.

A nurse will set the IV pump to infuse at how many millimeters per hour? ___

31. A health care provider orders oxytocin (Pitocin) 15 units IV in 500 mL of lactated ringers solution (LR) to infuse at 1 milliunit/min.

A nurse will set the IV pump to infuse at how many milliliters per hour? ___ ___

32. tirofiban (Aggrastat) is ordered to infuse at 0.1 mcg/kg/min for a patient weighing 136 lbs. A premixed IV bag that contains 12.5 mg in 250 mL NS is on hand. How many milliliters per hour will a nurse set the pump? _____

33. A health care provider orders dicloxacillin sodium 125 mg orally q6hr for a child who weighs 62 lb. The recommended dosage of dicloxacillin sodium for children weighing less than 40 kg is 12.5 to 25 mg/kg/day po in equally divided doses q6hr for moderate to severe infections.
Child's weight in kg: ____ _____
Is the dosage ordered in range: ANSWER EITHER yes or no ____ _____
Rationale:

34. A health care provider orders kanamycin sulfate (Kantrex) 34 mg IM q8hr for an Infant who weighs 7 lb 3 oz.
The recommended dosage is 15 mg/kg/day in 2 or 3 equal doses
Infant's weight in kg: _____ _____
Is the dosage ordered in range: ANSWER EITHER yes or no _ _____
Rationale:

35. A health care provider orders glycopyrrolste (Robinul) 50.8 mcg IM 60 minutes before surgery for a child who weighs 28 lb.
Recommended dosage is 4 mcg/kg 30 to 60 minutes before surgery
Child's weight in kg: ___ _____
Is the dosage order in range: ANSWER EITHER yes or no ____ _____
Rationale:

******SEE ATTACHED SEPARATE DOCUMENT FOR ANSWER KEY FOR BASIC MATH******

Medical-Surgical Practice Questions

1. **Heparin Protocol:** A patient is to receive a Heparin bolus of **80 units/kg**. The patient weighs **176 lbs**. How many **units** will the nurse administer?
2. **IV Flow Rate (gtt/min):** A physician orders **1,000 mL of 0.9% Normal Saline** to infuse over **8 hours**. The drop factor is **15 gtt/mL**. What is the flow rate in **gtt/min**?
3. **Capsule Dosage:** An order is for **Phenytoin 0.3 g** PO daily. Available are **100 mg capsules**. How many **capsules** will the nurse administer?
4. **IV Infusion Rate (mL/hr):** A patient is ordered **Vancomycin 1.5 g IVPB** to be infused over **120 minutes**. The pharmacy provides the medication in **500 mL of D5W**. What is the hourly rate in **mL/hr**?
5. **Potassium Safety:** An order is for **Potassium Chloride 40 mEq** to be added to **1,000 mL of IV fluids**. The available vial is **2 mEq/mL**. How many **mL** of Potassium Chloride should be added?
6. **Heparin Maintenance:** A Heparin drip is infusing at **1,200 units/hr**. The concentration is **25,000 units in 500 mL of 0.45% NS**. What is the current IV rate in **mL/hr**?
7. **Insulin Sliding Scale:** A patient's blood glucose is **284 mg/dL**. The sliding scale order is: *(BG - 100) / 20 = units of Humalog*. How many **units** should the nurse administer? (Round to the nearest whole number).
8. **Reconstitution:** An order is for **Ceftriaxone 750 mg** IM. The 1g vial states: *"Add 2.1 mL of diluent to yield a concentration of 350 mg/mL."* How many **mL** will the nurse administer? (Round to the nearest tenth).
9. **Continuous Infusion (mcg/kg/min):** A patient is receiving **Dopamine at 25 mL/hr**. The concentration is **400 mg in 250 mL of D5W**. The patient weighs **80 kg**. How many **mcg/kg/min** is the patient receiving?
10. **Oral Liquid Medication:** An order is for **Lactulose 30 g** PO. The available concentration is **10 g/15 mL**. How many **mL** will the nurse administ

Answer Key & Rationale: Medical Surgical Review

1. **6,400 units.** (176 lbs = 80 kg. 80 kg × 80 units/kg = 6,400 units).
2. **31 gtt/min.** (1,000 mL / 480 mins × 15 gtt = 31.25).
3. **3 capsules.** (0.3 g = 300 mg. 300 mg / 100 mg = 3 capsules).
4. **250 mL/hr.** (500 mL / 2 hours = 250 mL/hr).
5. **20 mL.** (40 mEq / 2 mEq/mL).
6. **24 mL/hr.** (1,200 units / 25,000 units × 500 mL = 24).
7. **9 units.** (284 - 100 = 184. 184 / 20 = 9.2, rounded to 9).
8. **2.1 mL.** (750 mg / 350 mg/mL = 2.14, rounded to 2.1).
9. **8.3 mcg/kg/min.** (25 mL/hr × 400 mg / 250 mL = 40 mg/hr. 40 mg/hr = 40,000 mcg/hr. 40,000 / 60 mins = 666.6 mcg/min. 666.6 / 80 kg = 8.33).
10. **45 mL.** (30 g / 10 g × 15 mL).

PEDIATRIC Practice Questions

Common Calculation Methods

1. **Weight-Based Dose:** Weight (kg) × Recommended mg/kg = Total Daily Dose.
2. **Safe Dose Range (SDR):** (Weight in kg × Min mg/kg/day) to (Weight in kg × Max mg/kg/day).
3. **Standard Formula:** (Desired Dose / On-Hand Dose) × Vehicle Volume = mL to administer.
4. **Maintenance Fluid Rate (Holliday-Segar):**
    - First 10 kg: 100 mL/kg
    - Next 10 kg: 50 mL/kg
    - Each kg over 20 kg: 20 mL/kg.

Additional Essential Resources

- **Practice Tests:** Access full quizzes on Nurseslabs and UWorld Nursing for NCLEX preparation.
- **Worksheets:** Download comprehensive pediatric dosage worksheets from Humber College or Germanna Community College.

- **Video Tutorials:** Review step-by-step solutions on the RegisteredNurseRN YouTube Channel or Level Up RN.

PEDIATRIC Practice Questions

Weight Conversions & Basic Dose Calculations

1. **Pounds to Kilograms:** A child weighs 44 lbs. What is their weight in kg?

2. **Acetaminophen Dose:** Order: Acetaminophen 15 mg/kg. The child weighs 12 kg. How many mg should be given?

3. **Ibuprofen mL Calculation:** Order: Ibuprofen 100 mg PO. Available: 100 mg/5 mL. How many mL do you administer?

4. **Antibiotic Dose:** Order: Amoxicillin 250 mg PO. Available: 125 mg/5 mL. How many mL do you administer?

5. **Weight Conversion (lb/oz):** An infant weighs 8 lbs 8 oz. What is the weight in kg? (Round to the nearest hundredth).

Safe Dose Range (SDR) Verification

6. **SDR Check:** A child weighs 15 kg. Order: Gentamicin 40 mg IV q8h. The safe range is 6–7.5 mg/kg/day. Is this dose safe?

7. **Maximum Dose:** A toddler weighs 11 kg. The safe range for a medication is 10–20 mg/kg/day. What is the maximum safe **daily** dose in mg?

8. **Minimum Dose:** Using the toddler in Question 7, what is the minimum safe **single** dose if the medication is given q6h (4 times a day)?

9. **Ceftriaxone Range:** Order: Ceftriaxone 400 mg IV q12h. Child weighs 20 kg. Safe range is 50–100 mg/kg/day. Is this dose within the safe range?

10. **SDR Decision:** A physician orders Digoxin 125 mcg PO daily for a 10 kg child. The safe range is 8–12 mcg/kg/day. Do you administer this dose or call the provider?

Divided Doses & IV Fluids

11. **Divided Dosing:** A medication order is for 600 mg/day to be given in divided doses every 6 hours. How many mg is each dose?

12. **Maintenance Fluids (Step 1):** Using the Holliday-Segar method, what is the 24-hour fluid requirement for a child weighing 8 kg?

13. **Maintenance Fluids (Step 2):** What is the 24-hour fluid requirement for a child weighing 15 kg?

14. **Maintenance Fluids (Step 3):** What is the 24-hour fluid requirement for a child weighing 25 kg?

15. **Hourly IV Rate:** Based on your answer for Question 14 (25 kg child), what is the hourly IV pump rate in mL/hr? (Round to the nearest whole number).

Advanced Calculations

16. **IV Bolus:** Order: 20 mL/kg Normal Saline bolus over 1 hour. Patient weighs 32 lbs. How many total mL will the patient receive?

17. **Dopamine Calculation:** Order: Dopamine 5 mcg/kg/min. Patient weighs 10 kg. How many mcg will the patient receive per **hour**?

18. **BSA Calculation:** Order: Methotrexate 25 mg/m². The child has a BSA of 0.6 m². What is the dose in mg?

19. **Syringe Selection:** You must administer 0.35 mL of a medication. Which syringe is most appropriate: a 1 mL tuberculin syringe or a 3 mL syringe?

20. **Reconstitution:** A vial of Ampicillin 500 mg is labeled: "Add 1.8 mL of sterile water to yield 250 mg/mL." If the order is for 125 mg, how many mL will you draw up?

PEDIATRIC Practice Questions Answer Key:

1. **20 kg** (44 / 2.2)
2. **180 mg** (15 x 12)
3. **5 ml**
4. **10 mL**
5. **3.86 kg** (8.5 lbs / 2.2)
6. **Yes.** Total daily = 120 mg. Range = 90–112.5 mg/day. (Wait, 120 mg is slightly *above* the 112.5 mg max. Result: **Unsafe/High**).
7. **220 mg/day** (11 x 20)
8. **27.5 mg** (110 mg total / 4 doses)
9. **Yes.** Total = 800 mg/day. Range = 1,000–2,000 mg/day. (Actually, 800 mg is *below* the 1,000 mg minimum. Result: **Sub-therapeutic**).
10. **Call the provider.** Max safe is 120 mcg; order is for 125 mcg.
11. **150 mg** (600 / 4)
12. **800 mL/day** (8 x 100)
13. **1,250 mL/day** (1,000 + [5 x 50])
14. **1,600 mL/day** (1,000 + 500 + [5 x 20])
15. **67 mL/hr** (1600 / 24)
16. **290.9 mL** (32 lbs = 14.54 kg. 14.54 x 20)
17. **3,000 mcg/hr** (5 x 10 x 60 mins)
18. **15 mg** (25 x 0.6)
19. **1 mL Tuberculin syringe** (for precision)
20. **0.5 mL** (125 / 250)

For more interactive practice, visit the Nurseslabs Pediatric Dosage Quiz or the RegisteredNurseRN Pediatric Math Review*

Pediatric Dosage Set #2 Practice Questions

1. **Basic Weight-Based Dose:** An order is for **Amoxicillin 20 mg/kg/day** divided into two doses (q12h) for a child weighing **33 lbs**. How many **mg** should the nurse administer per dose?

2. **Liquid Medication Volume:** A physician orders **Acetaminophen 240 mg** PO. The concentration available is **160 mg/5 mL**. How many **mL** will the nurse administer?

3. **Safe Dose Range (SDR) Verification:** A child weighs **20 kg**. The order is for **Clindamycin 150 mg IV q8h**. The safe range is **20–40 mg/kg/day**. Is this individual dose safe?

4. **Weight Conversion & Calculation:** An infant weighs **11 lbs 4 oz**. The order is for **Cefazolin 25 mg/kg** IV. How many **mg** will the nurse administer? (Round weight to the nearest hundredth).

5. **24-Hour Maintenance Fluids:** Using the Holliday-Segar method, calculate the **total 24-hour maintenance fluid volume (mL)** for a child who weighs **18 kg**.

6. **Hourly IV Pump Rate:** A child weighs **24 kg**. Based on standard maintenance fluid requirements, at what rate (**mL/hr**) should the nurse set the IV pump? (Round to the nearest whole number).

7. **Maximum Safe Dose:** A medication has a safe range of **5–10 mg/kg/dose**. For a child weighing **14 kg**, what is the **maximum** safe amount for a **single** dose?

8. **IV Bolus Rate:** An order is for a **20 mL/kg Normal Saline bolus** to be infused over **30 minutes**. The child weighs **15 kg**. At what rate (**mL/hr**) should the nurse set the infusion pump?

9. **Divided Dose Calculation:** A child is to receive **Valproic Acid 15 mg/kg/day** divided into three equal doses. If the child weighs **22 kg**, how many **mg** will be given for **each** dose?

10. **Reconstitution Volume:** A vial of **Ceftriaxone 1g** is reconstituted with 9.6 mL of diluent to provide a concentration of **100 mg/mL**. If the ordered dose is **350 mg**, how many **mL** should be drawn up?

Pediatric Dosage Set #2 Answer Key & Rationale

1. **150 mg per dose.** (33 lbs = 15 kg. 15 kg × 20 mg = 300 mg/day. Divided by 2 = 150 mg).

2. **7.5 mL.** (240 mg / 160 mg × 5 mL).

3. **Yes.** (Daily total = 450 mg. Safe daily range = 400–800 mg. The dose is within the safe daily limits).

4. **127.75 mg.** (11 lbs 4 oz = 11.25 lbs. 11.25 / 2.2 = 5.11 kg. 5.11 kg × 25 mg = 127.75 mg).

5. **1,400 mL.** (First 10 kg = 1,000 mL + next 8 kg × 50 mL = 400 mL).

6. **66 mL/hr.** (First 10 kg = 1,000 mL; next 10 kg = 500 mL; final 4 kg × 20 mL = 80 mL. Total = 1,580 mL / 24 hrs = 65.8).

7. **140 mg.** (14 kg × 10 mg/dose).

8. **600 mL/hr.** (15 kg × 20 mL = 300 mL total volume. To give 300 mL in 30 mins, the hourly rate must be doubled to 600).

9. **110 mg.** (22 kg × 15 mg = 330 mg total daily. 330 / 3 doses = 110 mg).

10. **3.5 mL.** (350 mg / 100 mg/mL).