**Lesson 12 Notes: Prime and Composite**

**Composite Number:**

**Prime Number:**

**Is 1 prime or composite?**

**Is 0 prime or composite?**

**Is 2 prime or composite?**

***Prime numbers are often referred to as the building blocks of whole numbers.***

Manipulatives like Base 10 Blocks are useful for teaching subtraction. ([Video](https://www.youtube.com/watch?v=JjpJVvvC-jI)) Matholia YouTube

**Example 1**

List the numbers 13 – 20 and identify if it is **Prime** or **Composite**.

13 17

14 18

15 19

16 20

Examples of prime numbers: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Prime Number Test**

How do you determine if a number is prime?

**Primes**

**Example 2** Prime or Composite?

1. **43,101**
2. **24,638**
3. **53**
4. **421**
5. **667**

**Sieve of Eratosthenes**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *To find prime numbers, you begin the process by crossing out 1, which is not prime,* | | | | | | | | | | | |
| *and then circling 2 and crossing out all multiples of 2. Then 3 is circled and all multiples of 3 are crossed out. This process is continued. The numbers in the Sieve of Eratosthenes that are not crossed out are prime.* | | | | | | | | | | |  |
|  | | | | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |  |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |  |  |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |  |  |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |  |  |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |  |  |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |  |  |
| 61 | 61 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |  |  |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |  |  |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |  |  |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |
| 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 |  |  |
| 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 |  |  |
| 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 |  |  |
| 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 |  |  |
| 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 |  |  |
| 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 |  |  |
| 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 |  |  |
| 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 |  |  |
| 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 |  |  |
| 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |  |  |
| 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 |  |  |
| 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 |  |  |
| 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 |  |  |
| 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 |  |  |
| 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 |  |  |
| 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 |  |  |
| 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 |  |  |
| 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 |  |  |
| 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 |  |  |
| 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 |  |  |
| 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 |  |  |
| 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 |  |  |
| 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 |  |  |
| 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 |  |  |
| 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 |  |  |
| 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 |  |  |
| 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 |  |  |
| 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 |  |  |
| 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 |  |  |
| 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 |  |  |

Composite numbers can always be written as a product of **\_\_\_\_\_\_\_\_\_\_\_\_\_.**

One method to find the prime factorization of a composite number is by using a \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Fundamental Theorem of Arithmetic**

**Prime Factorization**

To find the prime factorization of a composite number, rewrite the number as a product of two smaller natural numbers. If these smaller numbers are both prime, you are finished. If either is not prime, then rewrite it as the product of smaller natural numbers. Continue until all the factors are prime.

**Example 3:** Find the prime factorization of each number. Show your work.

12 40

**Example 3 (cont’d):** Find the prime factorization of each number. Show your work.

75 88

924 360

**Factors**

**List the factors of 10:**

**Number of Divisors**

**Example 4:** Find the number of positive divisors of 1,000,000.