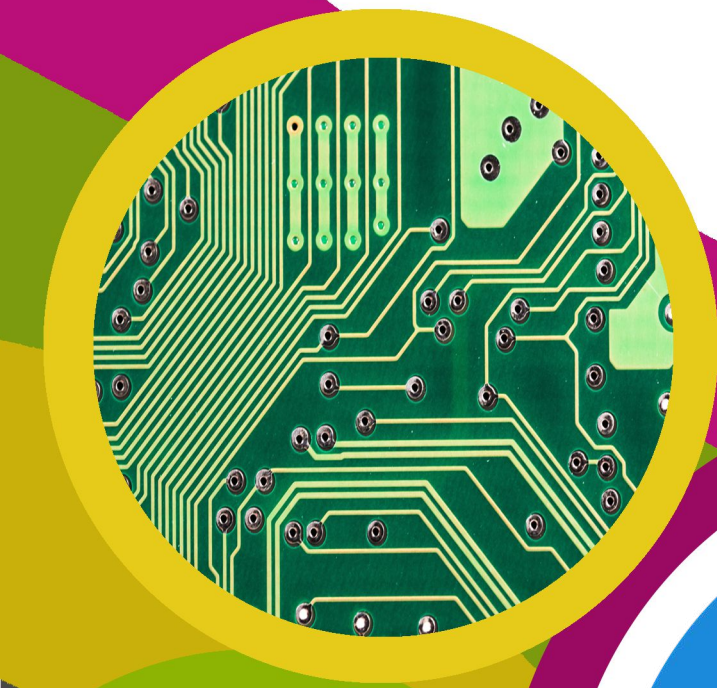


# technocamps

## Cryptography Workbook



## Overview

In this workshop we will be looking at Cryptographic and steganographic techniques, from understanding the history behind such methods to there strengths and weakness as well as implementation.

1. Improved knowledge of cryptographic and steganographic techniques.
2. Greater experience of abstract problem solving.
3. New appreciation of historical figures, chemical reactions and mathematics.

## Learning Outcomes

## Attendee Prerequisites

1. No previous knowledge of cryptography or steganography required.

## Spider Diagram

Draw a spider diagram of when and where you need to send and receive secret messages:



## Define Steganography

Steganography is \_\_\_\_\_

\_\_\_\_\_

It comes from the greek word \_\_\_\_\_ meaning \_\_\_\_\_

and the greek word \_\_\_\_\_ meaning \_\_\_\_\_

Steganography is used in:

- \_\_\_\_\_
- \_\_\_\_\_

## Histiaeus's Servant

Use the space below to draw out the process Histiaeus used to send a secret message:

## Problems with the System

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_

## Bacon Cipher Example

Hidden message: Bacon is good

Regular message: I went to school today, it was raining. No I do not like it when it rains.

Font type A: Uppercase

Font type B: Lowercase

Hidden message enciphered:

|       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| B     | A     | C     | O     | N     | I     | S     |
| AAAAB | AAAAA | AAABA | ABBBA | ABBAB | ABAAA | BAABA |
| G     | O     | O     | D     |       |       |       |
| AABBA | ABBBA | ABBBA | AAABB |       |       |       |

Hidden message inside regular message:

I WENT TO SCHOOL tODay, iT Was RaInING. nO I dO NOt lIkE it WHen iT RAIns.

## Bacon Cipher Practice

|          |           |          |          |
|----------|-----------|----------|----------|
| a: AAAAA | h: AABBB  | o: ABBBA | v: BABAB |
| b: AAAAB | i: ABAAA  | p: ABBBB | w: BABBA |
| c: AAABA | j: ABAAB  | q: BAAAA | x: BABBB |
| d: AAABB | k: ABABA  | r: BAAAB | y: BBAAA |
| e: AABAA | l: ABABB  | s: BAABA | z: BBAAB |
| f: AABAB | m: ABBA A | t: BAABB |          |
| g: AABBA | n: ABBAB  | u: BABAA |          |

Try and decrypt these messages:

1. ChoCOLAtE CaKEs ArE TaSTY WE ALSo lOVE pLE

\_\_\_\_\_

2. THe grAsS IS GREEnEr WHERe yOU WAtEr

\_\_\_\_\_

3. ChEeSEY cHIps YUM

\_\_\_\_\_

4. tHe qUIcK brOWN FOX juMpS oVER tHE lAZy Dog aNd SO Did I. iT IS  
vERY fun

\_\_\_\_\_

5. Extension: Create your own hidden message using upper and lower case.  
Hidden message: \_\_\_\_\_

Enciphered message: \_\_\_\_\_

Regular message: \_\_\_\_\_

Hidden message inside regular message: \_\_\_\_\_

## Problems with the Bacon Cipher?

1. 

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---

---
2. 

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## Make Your Own Invisible Ink

Step 1:

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Step 2:

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---

Why does this work?

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## What Is Cryptography?

In your own words, write down what you think cryptography is below:

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---

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## Define Cryptography

Cryptography is \_\_\_\_\_

---

It comes from the greek word \_\_\_\_\_ meaning \_\_\_\_\_

and the greek word \_\_\_\_\_ meaning \_\_\_\_\_

Cryptography is used in:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

Cryptography is different from Steganography as \_\_\_\_\_

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## Make Your Own Code Book

In the spaces provided, write replacements for the words given

|                 |                |               |
|-----------------|----------------|---------------|
| Beacons = _____ | Fly = _____    | Light = _____ |
| Lit = _____     | Fools = _____  | Day = _____   |
| Gondor = _____  | Look = _____   | Dawn = _____  |
| Calls = _____   | Coming = _____ | East = _____  |
| Aid = _____     | First = _____  | Fifth = _____ |

Translate the sentences using your code book:

- The beacons are lit, Gondor calls for aid  
\_\_\_\_\_
- Fly you fools  
\_\_\_\_\_
- Look to my coming at first light on the fifth day. At dawn, look to the East  
\_\_\_\_\_

Extension: Come up with your own code words, write out the original sentence and the encoded sentences.

|               |               |               |
|---------------|---------------|---------------|
| _____ = _____ | _____ = _____ | _____ = _____ |
| _____ = _____ | _____ = _____ | _____ = _____ |
| _____ = _____ | _____ = _____ | _____ = _____ |

Original sentence: \_\_\_\_\_

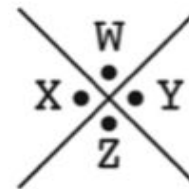
Encoded sentence: \_\_\_\_\_

# Pig Pen Practice

Use the space below to encrypt and decrypt the messages:

|   |   |   |
|---|---|---|
| A | B | C |
| D | E | F |
| G | H | I |

|   |   |   |
|---|---|---|
| J | K | L |
| M | N | O |
| P | Q | R |



Encrypt:

- I'll be back : \_\_\_\_\_
- Mama always said life was like a box of chocolates

Decrypt:

[illegible]

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. 62. 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. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840.

Extension: Create your own secret messages on the extra pages at the back of the workbook.

## Codes vs. Ciphers

In your own words, write down the difference between codes and ciphers:

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## Julius Caesar Fact File

Julius Caesar was born in \_\_\_\_\_ BC and died in \_\_\_\_\_ BC.

How did Julius Caesar die?

---

Which month is named after Julius Caesar?

---

How old was Julius Caesar when he was elected to Consul?

---

Interesting fact about Julius Caesar?

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## Shift Cipher Practice

Using the cipher wheels you have just made, decrypt the following messages:  
Caesar cipher, key = 3:

- Whfkqrfdpsv lv ehwwhu wk dq vfkrro zrun

---

- Brx'uh jrqqd qhhg d eljjhu erdw

---

Key = 9:

- Cxcx r'en j onnurwp fn'an wxc rw tjwbjb jwhvxan

---

Key = 21:

- Yj jm yj ijo. Oczmz dn ij omt

---

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Extension: key not given

- Z druv r gifdzjv di wifuf. R gifdzjv. "Ufe'k pfl cvrmv yzd jrdnzjv xrdxvv" reu z ufe'k dvre kf

---

---

Extension: create a message and encrypt it with your own choice of key:

Key = \_\_\_\_\_

Message: \_\_\_\_\_



# Rail Fence Cipher Practice

Key = 3:

- Wittuvaoeeldnwntsriewntlvloaoviti

[illegible]

- Jksmutepwmigsein

[illegible]

Extension: key not given

- Mdsriolosknegttreeodafo

[illegible]

Extension: Create your own messages and encrypt them on the back pages of the workbook.

## Notes



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