

## Create Multiple Passwords

Examples with varying complexity:

- apple123 (lowercase + numbers, short length)
- Apple123 (uppercase + lowercase + numbers)
- Apple@123 (adds symbol)
- ApPlE@12345 (mixed case, symbol, longer length)
- Tr0ub4dor&3x@mpl3! (complex passphrase style)
- J7\$rNq1zXy!p (randomized, very strong)

Test on Password Strength Checker

<https://passwordmeter.com/>

Test Your Password		Minimum Requirements			
Password:	<input type="text" value="Apple123"/>	<ul style="list-style-type: none"><li>• Minimum 8 characters in length</li><li>• Contains 3/4 of the following items:<ul style="list-style-type: none"><li>- Uppercase Letters</li><li>- Lowercase Letters</li><li>- Numbers</li><li>- Symbols</li></ul></li></ul>			
Hide:	<input type="checkbox"/>				
Score:	63%				
Complexity:	Strong				
Additions		Type	Rate	Count	Bonus
✓	Number of Characters	Flat	$+(n^4)$	8	+ 32
✓	Uppercase Letters	Cond/Incr	$+(len-n)^2$	1	+ 14
ⓘ	Lowercase Letters	Cond/Incr	$+(len-n)^2$	4	+ 8
ⓘ	Numbers	Cond	$+(n^4)$	3	+ 12
✗	Symbols	Flat	$+(n^6)$	0	0
ⓘ	Middle Numbers or Symbols	Flat	$+(n^2)$	2	+ 4
✓	Requirements	Flat	$+(n^2)$	4	+ 8
Deductions					
✓	Letters Only	Flat	$-n$	0	0
✓	Numbers Only	Flat	$-n$	0	0
ⓘ	Repeat Characters (Case Insensitive)	Comp	-	2	- 2
✓	Consecutive Uppercase Letters	Flat	$-(n^2)$	0	0
ⓘ	Consecutive Lowercase Letters	Flat	$-(n^2)$	3	- 6
ⓘ	Consecutive Numbers	Flat	$-(n^2)$	2	- 4
✓	Sequential Letters (3+)	Flat	$-(n^3)$	0	0
ⓘ	Sequential Numbers (3+)	Flat	$-(n^3)$	1	- 3
✓	Sequential Symbols (3+)	Flat	$-(n^3)$	0	0
Legend					
ⓘ <b>Exceptional:</b> Exceeds minimum standards. Additional bonuses are applied.					
✓ <b>Sufficient:</b> Meets minimum standards. Additional bonuses are applied.					
ⓘ <b>Warning:</b> Advisory against employing bad practices. Overall score is reduced.					
✗ <b>Failure:</b> Does not meet the minimum standards. Overall score is reduced.					

Test Your Password		Minimum Requirements			
Password:	<input type="text" value="Apple@123"/>	<ul style="list-style-type: none"><li>• Minimum 8 characters in length</li><li>• Contains 3/4 of the following items:<ul style="list-style-type: none"><li>- Uppercase Letters</li><li>- Lowercase Letters</li><li>- Numbers</li><li>- Symbols</li></ul></li></ul>			
Hide:	<input type="checkbox"/>				
Score:	81%				
Complexity:	Very Strong				
Additions		Type	Rate	Count	Bonus
ⓘ	Number of Characters	Flat	$+(n^4)$	9	+ 36
✓	Uppercase Letters	Cond/Incr	$+(len-n)^2$	1	+ 16
ⓘ	Lowercase Letters	Cond/Incr	$+(len-n)^2$	4	+ 10
ⓘ	Numbers	Cond	$+(n^4)$	3	+ 12
✓	Symbols	Flat	$+(n^6)$	1	+ 6
ⓘ	Middle Numbers or Symbols	Flat	$+(n^2)$	3	+ 6
ⓘ	Requirements	Flat	$+(n^2)$	5	+ 10
Deductions					
✓	Letters Only	Flat	$-n$	0	0
✓	Numbers Only	Flat	$-n$	0	0
ⓘ	Repeat Characters (Case Insensitive)	Comp	-	2	- 2
✓	Consecutive Uppercase Letters	Flat	$-(n^2)$	0	0
ⓘ	Consecutive Lowercase Letters	Flat	$-(n^2)$	3	- 6
ⓘ	Consecutive Numbers	Flat	$-(n^2)$	2	- 4
✓	Sequential Letters (3+)	Flat	$-(n^3)$	0	0
ⓘ	Sequential Numbers (3+)	Flat	$-(n^3)$	1	- 3
✓	Sequential Symbols (3+)	Flat	$-(n^3)$	0	0
Legend					
ⓘ <b>Exceptional:</b> Exceeds minimum standards. Additional bonuses are applied.					
✓ <b>Sufficient:</b> Meets minimum standards. Additional bonuses are applied.					
ⓘ <b>Warning:</b> Advisory against employing bad practices. Overall score is reduced.					
✗ <b>Failure:</b> Does not meet the minimum standards. Overall score is reduced.					

Test Your Password		Minimum Requirements	
Password:	<input type="text" value="ApPIE@12345"/>	<ul style="list-style-type: none"><li>Minimum 8 characters in length</li><li>Contains 3/4 of the following items:<ul style="list-style-type: none"><li>Uppercase Letters</li><li>Lowercase Letters</li><li>Numbers</li><li>Symbols</li></ul></li></ul>	
Hide:	<input type="checkbox"/>		
Score:	<div><div>100%</div></div>		
Complexity:	Very Strong		

Additions	Type	Rate	Count	Bonus
Number of Characters	Flat	$+(n^*4)$	<input type="text" value="11"/>	+ 44
Uppercase Letters	Cond/Incr	$+\left((len-n)^*2\right)$	<input type="text" value="3"/>	+ 16
Lowercase Letters	Cond/Incr	$+\left((len-n)^*2\right)$	<input type="text" value="2"/>	+ 18
Numbers	Cond	$+(n^*4)$	<input type="text" value="5"/>	+ 20
Symbols	Flat	$+(n^*6)$	<input type="text" value="1"/>	+ 6
Middle Numbers or Symbols	Flat	$+(n^*2)$	<input type="text" value="5"/>	+ 10
Requirements	Flat	$+(n^*2)$	<input type="text" value="5"/>	+ 10

Deductions	Type	Rate	Count	Bonus
Letters Only	Flat	$-n$	<input type="text" value="0"/>	0
Numbers Only	Flat	$-n$	<input type="text" value="0"/>	0
Repeat Characters (Case Insensitive)	Comp	-	<input type="text" value="0"/>	0
Consecutive Uppercase Letters	Flat	$-(n^*2)$	<input type="text" value="0"/>	0
Consecutive Lowercase Letters	Flat	$-(n^*2)$	<input type="text" value="0"/>	0
Consecutive Numbers	Flat	$-(n^*2)$	<input type="text" value="4"/>	- 8
Sequential Letters (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0
Sequential Numbers (3+)	Flat	$-(n^*3)$	<input type="text" value="3"/>	- 9
Sequential Symbols (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0

Legend
<b>Exceptional:</b> Exceeds minimum standards. Additional bonuses are applied.
<b>Sufficient:</b> Meets minimum standards. Additional bonuses are applied.
<b>Warning:</b> Advisory against employing bad practices. Overall score is reduced.
<b>Failure:</b> Does not meet the minimum standards. Overall score is reduced.

Test Your Password		Minimum Requirements	
Password:	<input type="text" value="Tr0ub4dor&amp;3x@mpl3!"/>	<ul style="list-style-type: none"><li>Minimum 8 characters in length</li><li>Contains 3/4 of the following items:<ul style="list-style-type: none"><li>Uppercase Letters</li><li>Lowercase Letters</li><li>Numbers</li><li>Symbols</li></ul></li></ul>	
Hide:	<input type="checkbox"/>		
Score:	<div><div>100%</div></div>		
Complexity:	Very Strong		

Additions	Type	Rate	Count	Bonus
Number of Characters	Flat	$+(n^*4)$	<input type="text" value="18"/>	+ 72
Uppercase Letters	Cond/Incr	$+\left((len-n)^*2\right)$	<input type="text" value="1"/>	+ 34
Lowercase Letters	Cond/Incr	$+\left((len-n)^*2\right)$	<input type="text" value="10"/>	+ 16
Numbers	Cond	$+(n^*4)$	<input type="text" value="4"/>	+ 16
Symbols	Flat	$+(n^*6)$	<input type="text" value="3"/>	+ 18
Middle Numbers or Symbols	Flat	$+(n^*2)$	<input type="text" value="6"/>	+ 12
Requirements	Flat	$+(n^*2)$	<input type="text" value="5"/>	+ 10

Deductions	Type	Rate	Count	Bonus
Letters Only	Flat	$-n$	<input type="text" value="0"/>	0
Numbers Only	Flat	$-n$	<input type="text" value="0"/>	0
Repeat Characters (Case Insensitive)	Comp	-	<input type="text" value="4"/>	- 1
Consecutive Uppercase Letters	Flat	$-(n^*2)$	<input type="text" value="0"/>	0
Consecutive Lowercase Letters	Flat	$-(n^*2)$	<input type="text" value="5"/>	- 10
Consecutive Numbers	Flat	$-(n^*2)$	<input type="text" value="0"/>	0
Sequential Letters (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0
Sequential Numbers (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0
Sequential Symbols (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0

Legend
<b>Exceptional:</b> Exceeds minimum standards. Additional bonuses are applied.
<b>Sufficient:</b> Meets minimum standards. Additional bonuses are applied.
<b>Warning:</b> Advisory against employing bad practices. Overall score is reduced.
<b>Failure:</b> Does not meet the minimum standards. Overall score is reduced.

Test Your Password		Minimum Requirements	
Password:	<input type="text" value="J7\$!nQ1zXylp"/>	<ul style="list-style-type: none"><li>Minimum 8 characters in length</li><li>Contains 3/4 of the following items:<ul style="list-style-type: none"><li>Uppercase Letters</li><li>Lowercase Letters</li><li>Numbers</li><li>Symbols</li></ul></li></ul>	
Hide:	<input type="checkbox"/>		
Score:	<div><div>100%</div></div>		
Complexity:	Very Strong		

Additions	Type	Rate	Count	Bonus
Number of Characters	Flat	$+(n^*4)$	<input type="text" value="12"/>	+ 48
Uppercase Letters	Cond/Incr	$+\left((len-n)^*2\right)$	<input type="text" value="3"/>	+ 18
Lowercase Letters	Cond/Incr	$+\left((len-n)^*2\right)$	<input type="text" value="5"/>	+ 14
Numbers	Cond	$+(n^*4)$	<input type="text" value="2"/>	+ 8
Symbols	Flat	$+(n^*6)$	<input type="text" value="2"/>	+ 12
Middle Numbers or Symbols	Flat	$+(n^*2)$	<input type="text" value="4"/>	+ 8
Requirements	Flat	$+(n^*2)$	<input type="text" value="5"/>	+ 10

Deductions	Type	Rate	Count	Bonus
Letters Only	Flat	$-n$	<input type="text" value="0"/>	0
Numbers Only	Flat	$-n$	<input type="text" value="0"/>	0
Repeat Characters (Case Insensitive)	Comp	-	<input type="text" value="0"/>	0
Consecutive Uppercase Letters	Flat	$-(n^*2)$	<input type="text" value="0"/>	0
Consecutive Lowercase Letters	Flat	$-(n^*2)$	<input type="text" value="0"/>	0
Consecutive Numbers	Flat	$-(n^*2)$	<input type="text" value="0"/>	0
Sequential Letters (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0
Sequential Numbers (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0
Sequential Symbols (3+)	Flat	$-(n^*3)$	<input type="text" value="0"/>	0

Legend
<b>Exceptional:</b> Exceeds minimum standards. Additional bonuses are applied.
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Password	Strength/Score	Time to Crack	Feedback
apple123	Weak	Seconds	Too short, common pattern
Apple123	Weak/Medium	Minutes	Slightly better, still predictable
Apple@123	Medium	Hours	Add more length & randomness
ApPlE@12345	Strong	Years	Good mix, but still pattern-based
Tr0ub4dor&3x@mpl3!	Very Strong	Centuries	Excellent complexity & length
J7\$rNq1zXy!p	Very Strong	Centuries	High randomness, secure

### Best Practices for Strong Passwords

- Use at least **12–16 characters**.
- Combine **uppercase, lowercase, numbers, and symbols**.
- Avoid dictionary words or predictable patterns (e.g., Password123).
- Use **passphrases** (e.g., Blue\$Tiger!Runs7Fast).
- Ensure **randomness** — don't base passwords on personal info.
- Use a **password manager** to store and generate secure passwords.
- Never reuse the same password for multiple accounts.

### Common Password Attacks

- **Brute Force Attack:** Tries all possible combinations until it finds the match.
- **Dictionary Attack:** Uses lists of common words/passwords to guess.
- **Credential Stuffing:** Uses leaked username-password combos from breaches.
- **Phishing:** Tricks user into revealing the password.
- **Keylogging:** Records keystrokes to steal passwords.

## How Complexity Affects Security

- **Short & simple passwords** → Cracked in seconds via brute force.
- **Medium complexity** → May last hours or days, but still vulnerable.
- **High complexity + long length** → Resistant to brute force for centuries.
- Randomness is key — predictable substitutions like P@ssw0rd! are still weak.