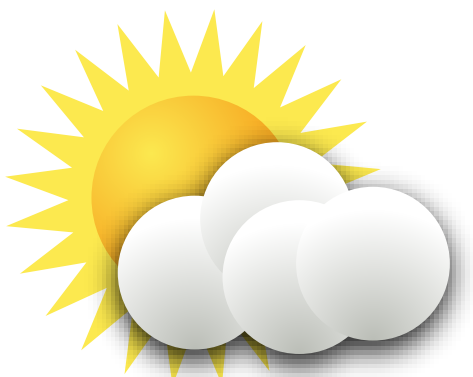
Beware of Optimistic Weather Forecasts

C. Boura, A. Canteaut, and C. De Cannière



August 17, 2010

Wednesday, August 18, 2010

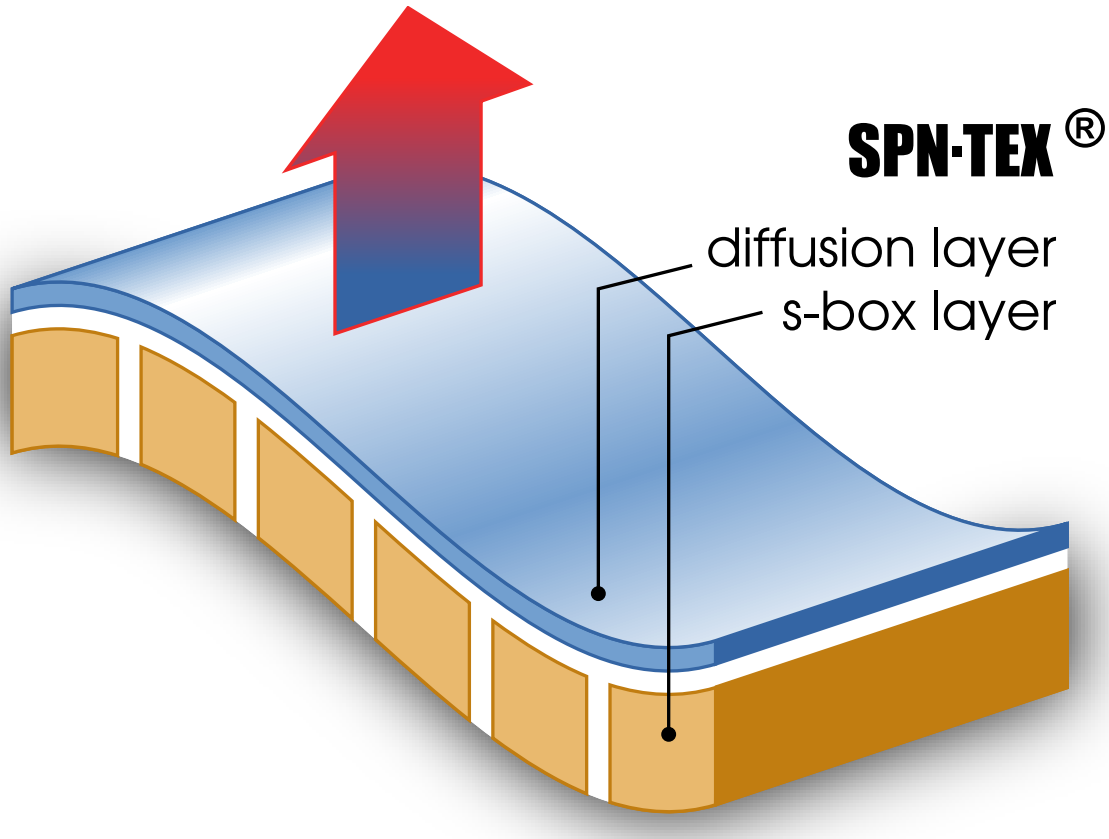
18:00 – 20:00: **Beach Barbecue at Goleta Beach**

One Fundamental Question

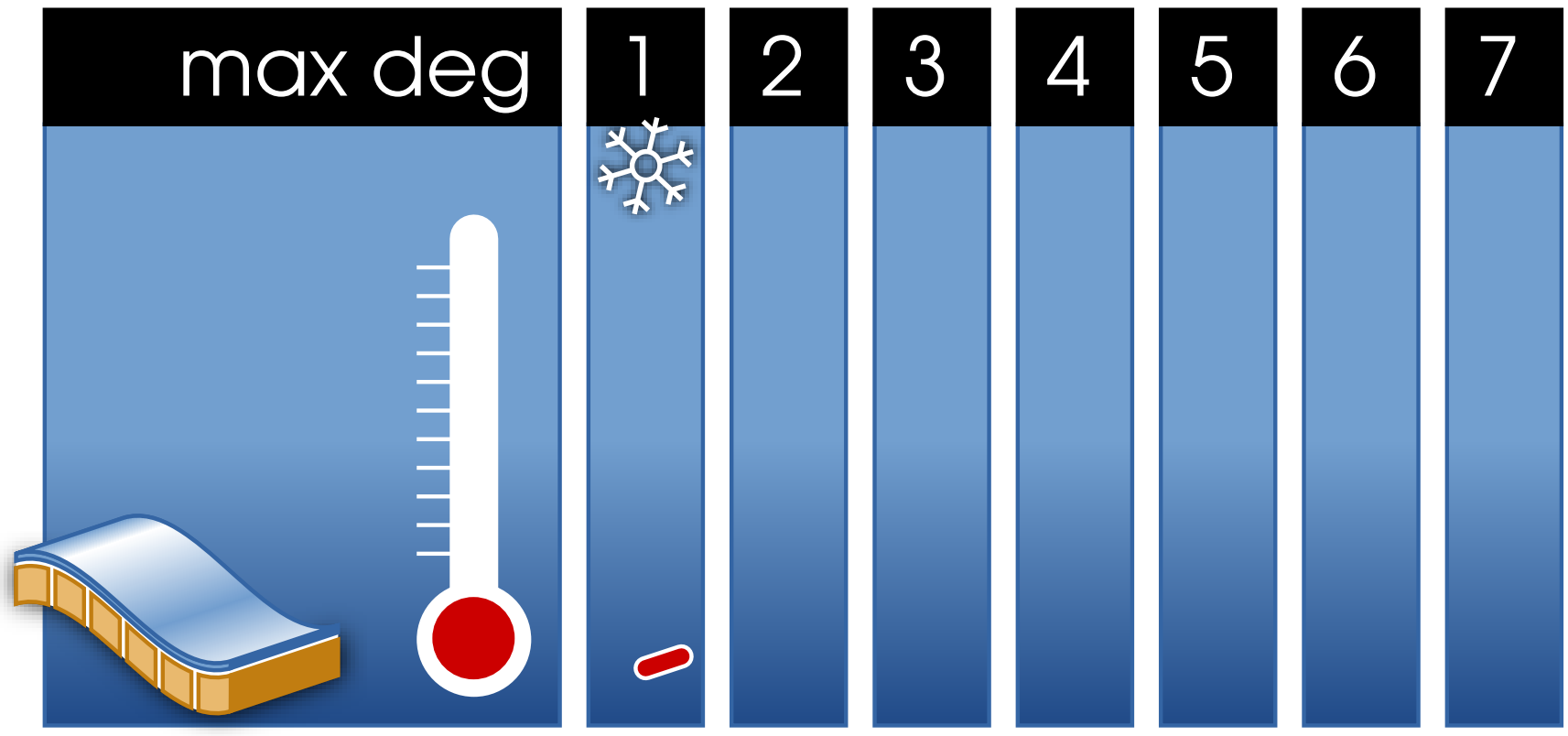
Q: What to wear?

SPN Fabric

A: High-Tech Clothing



Maximum Degree (Old Bound)



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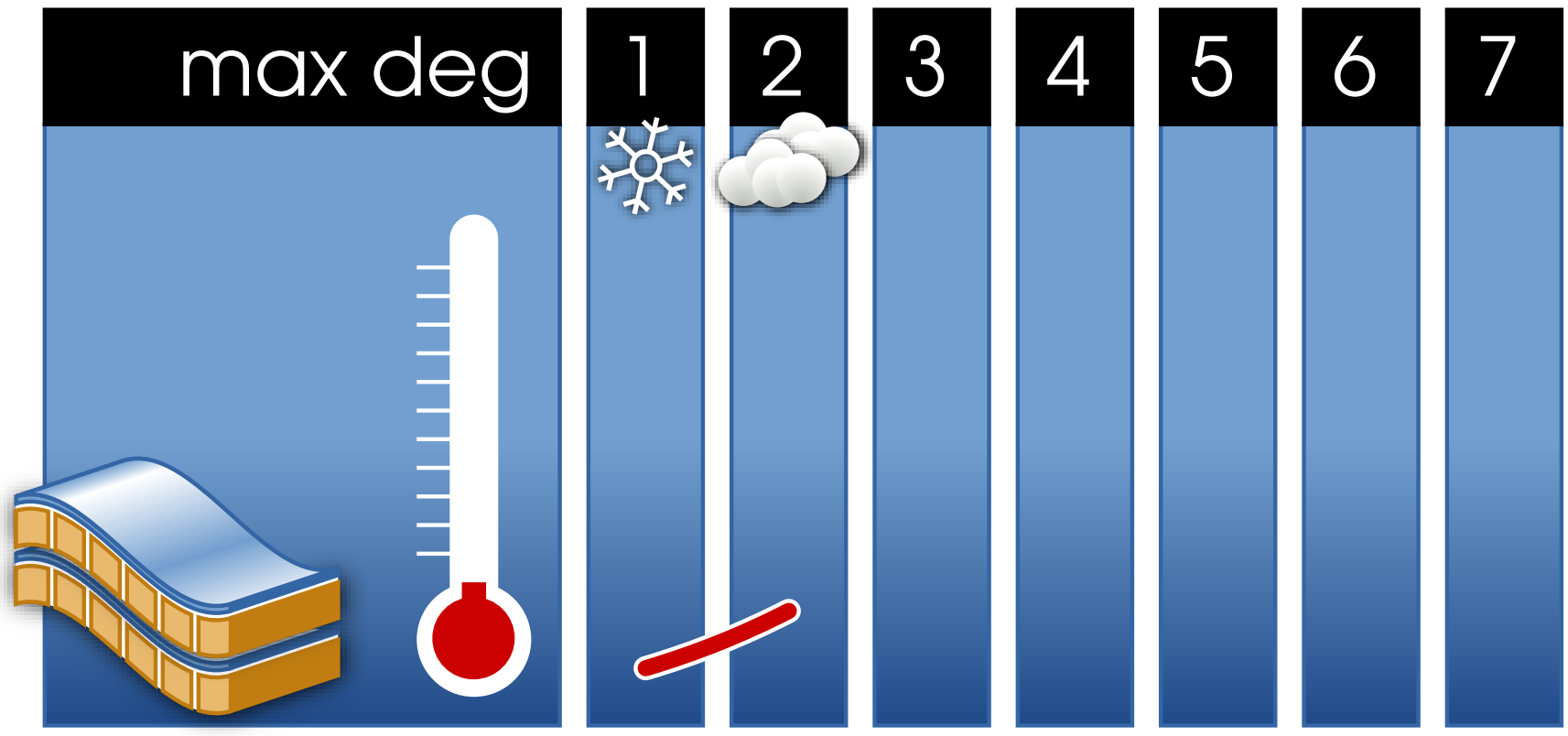

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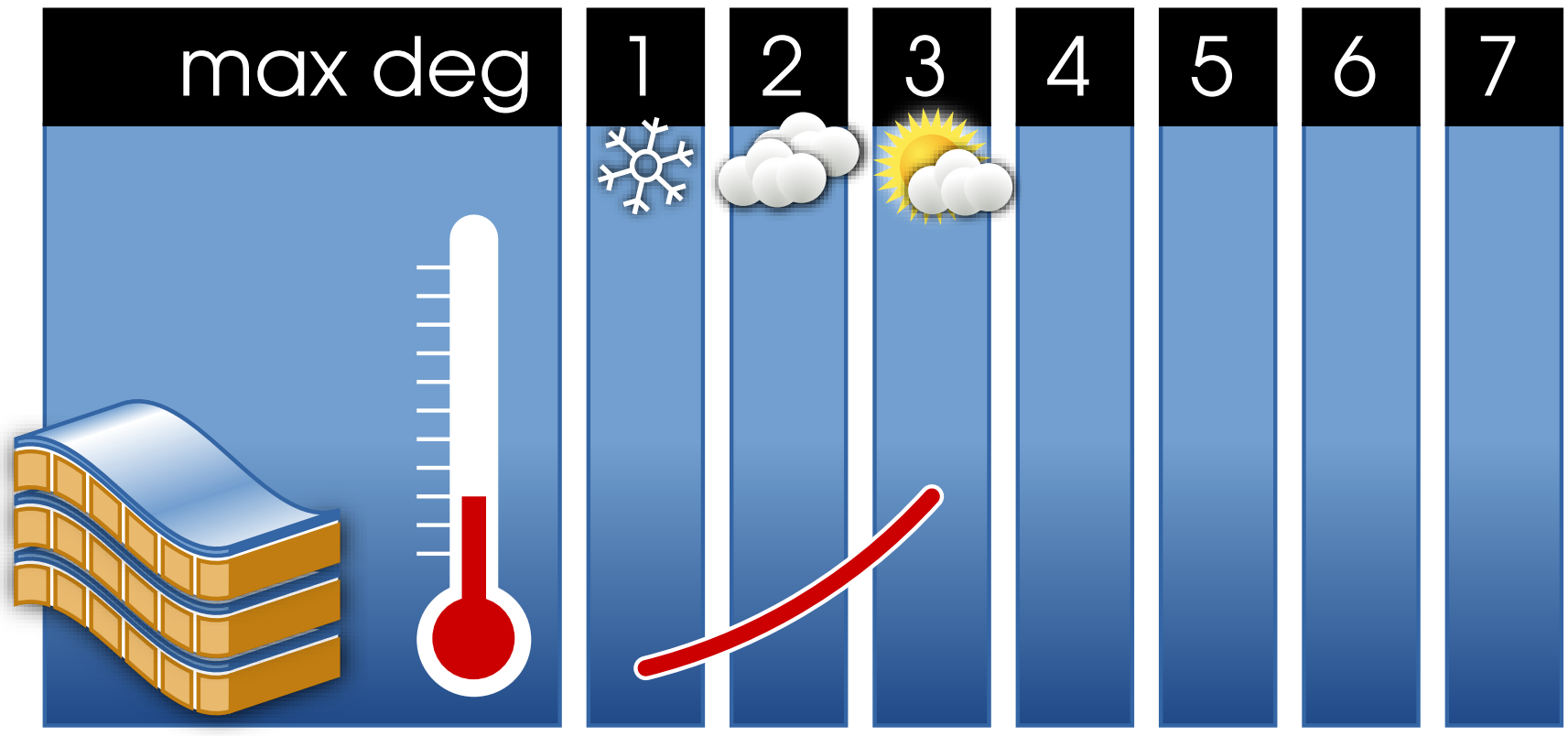
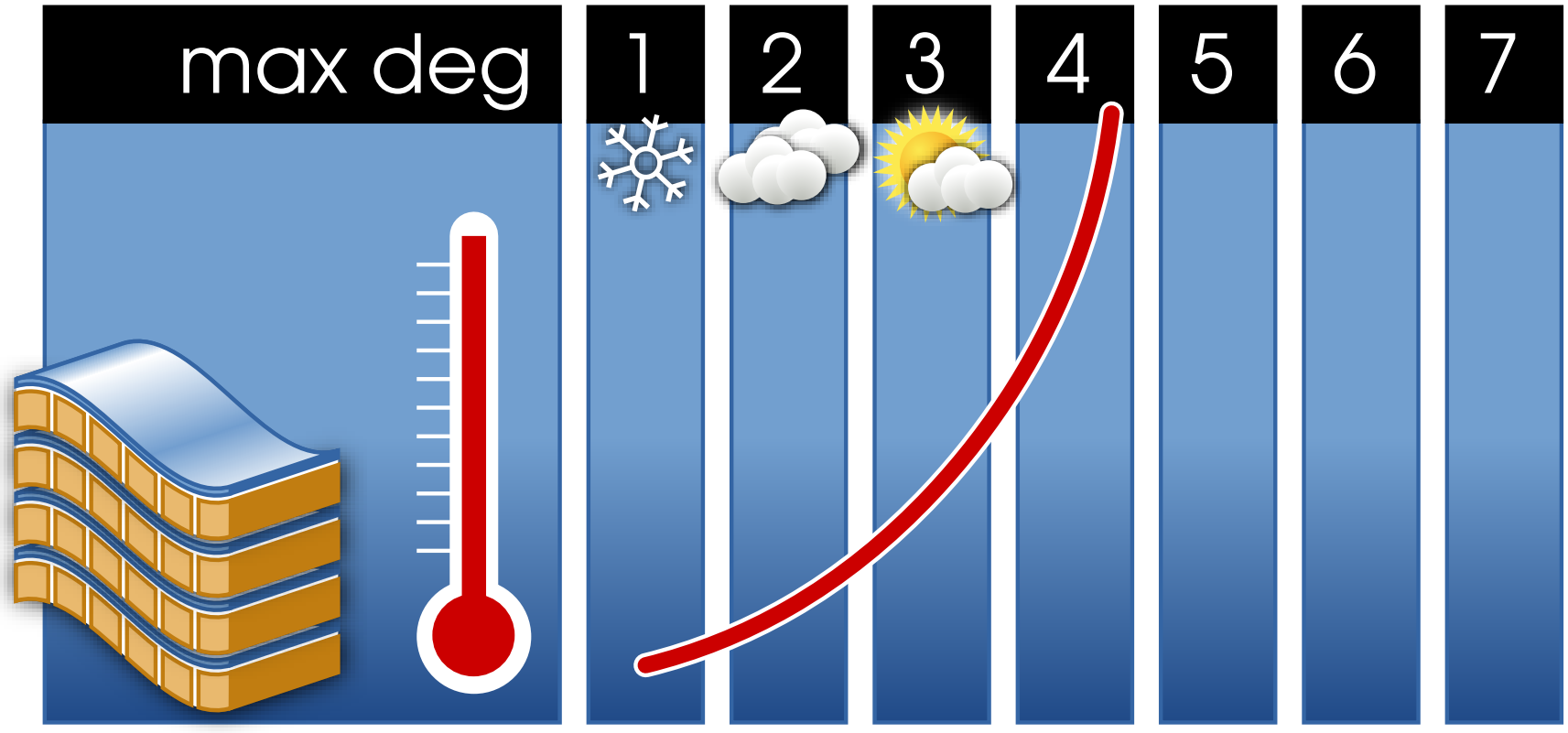


Maximum Degree (Old Bound)



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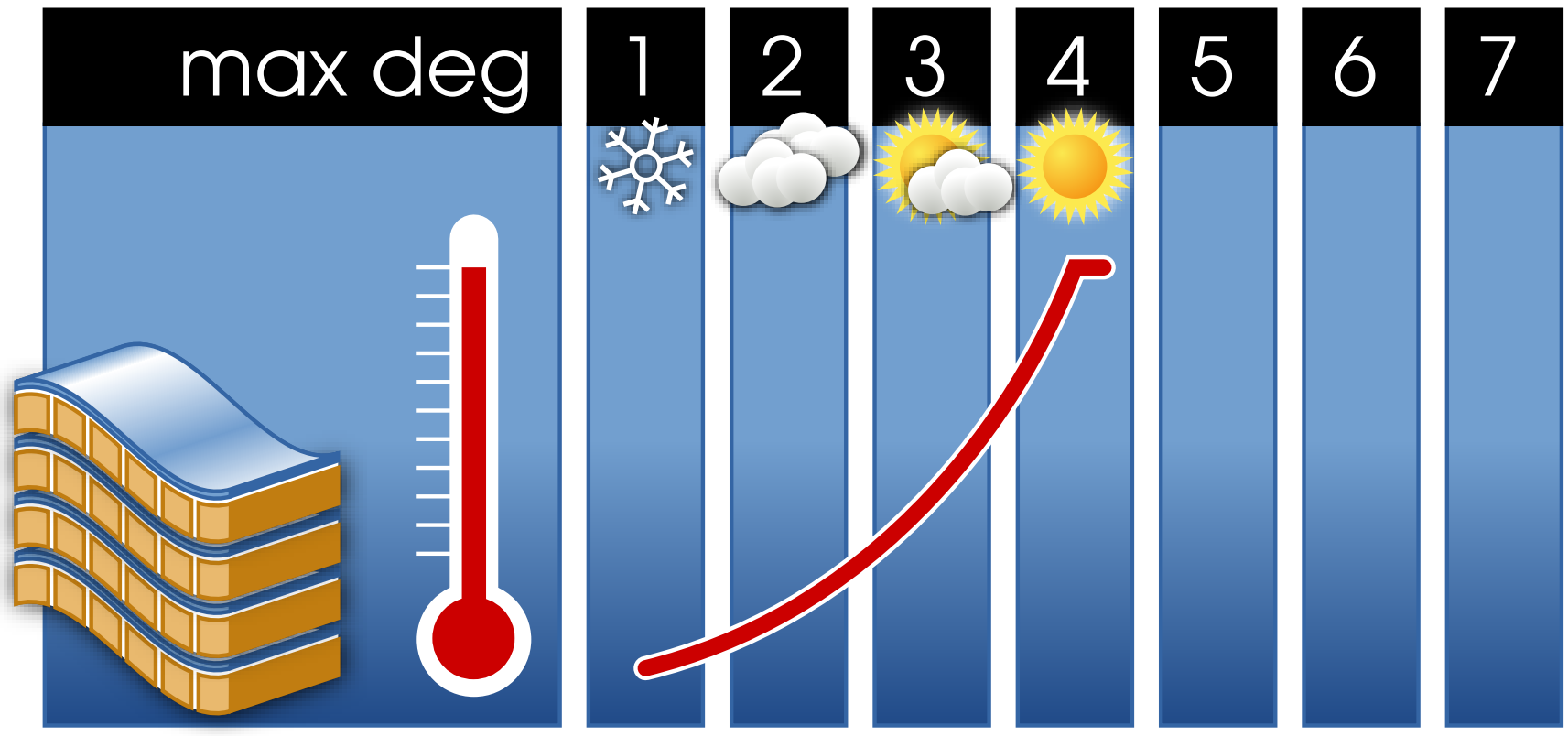
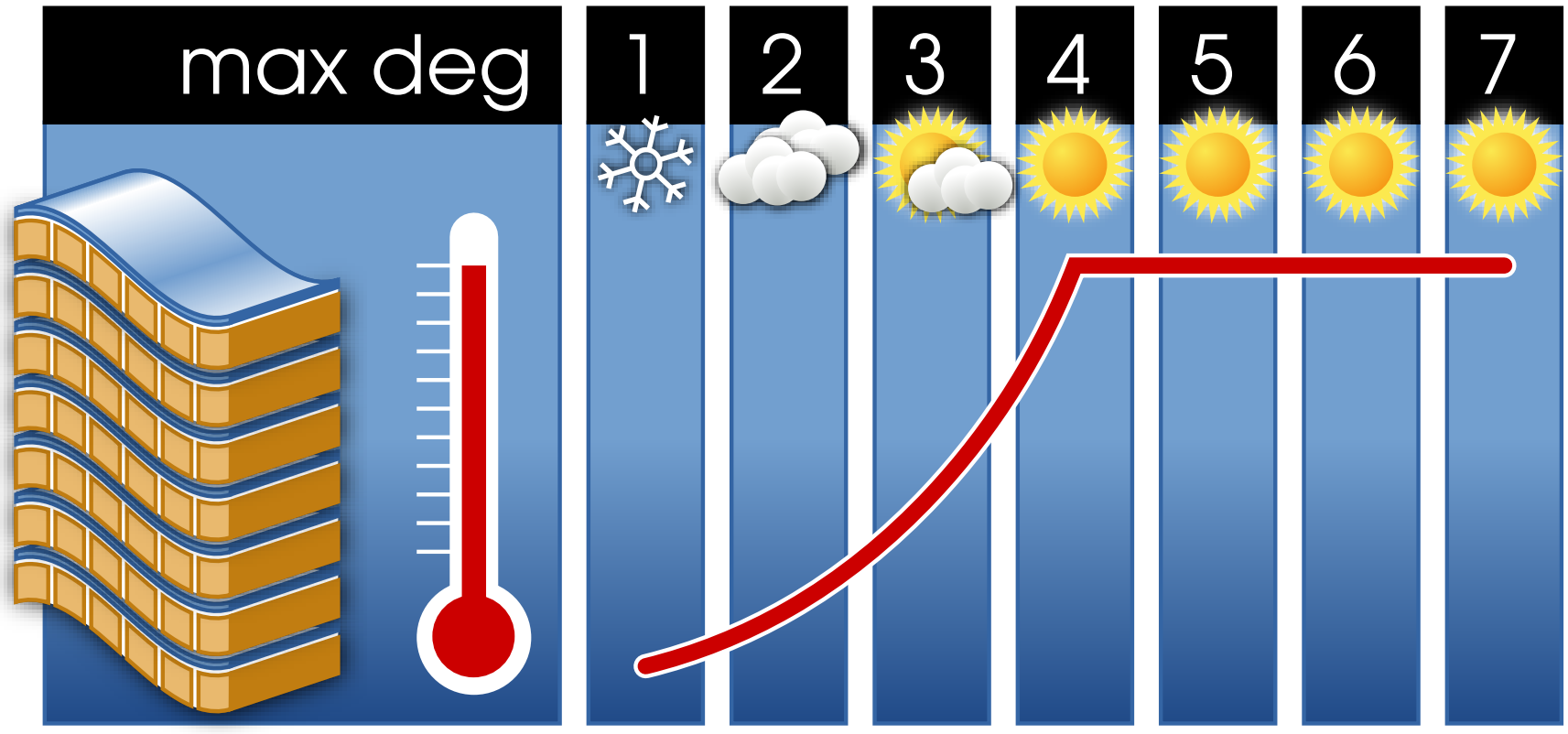
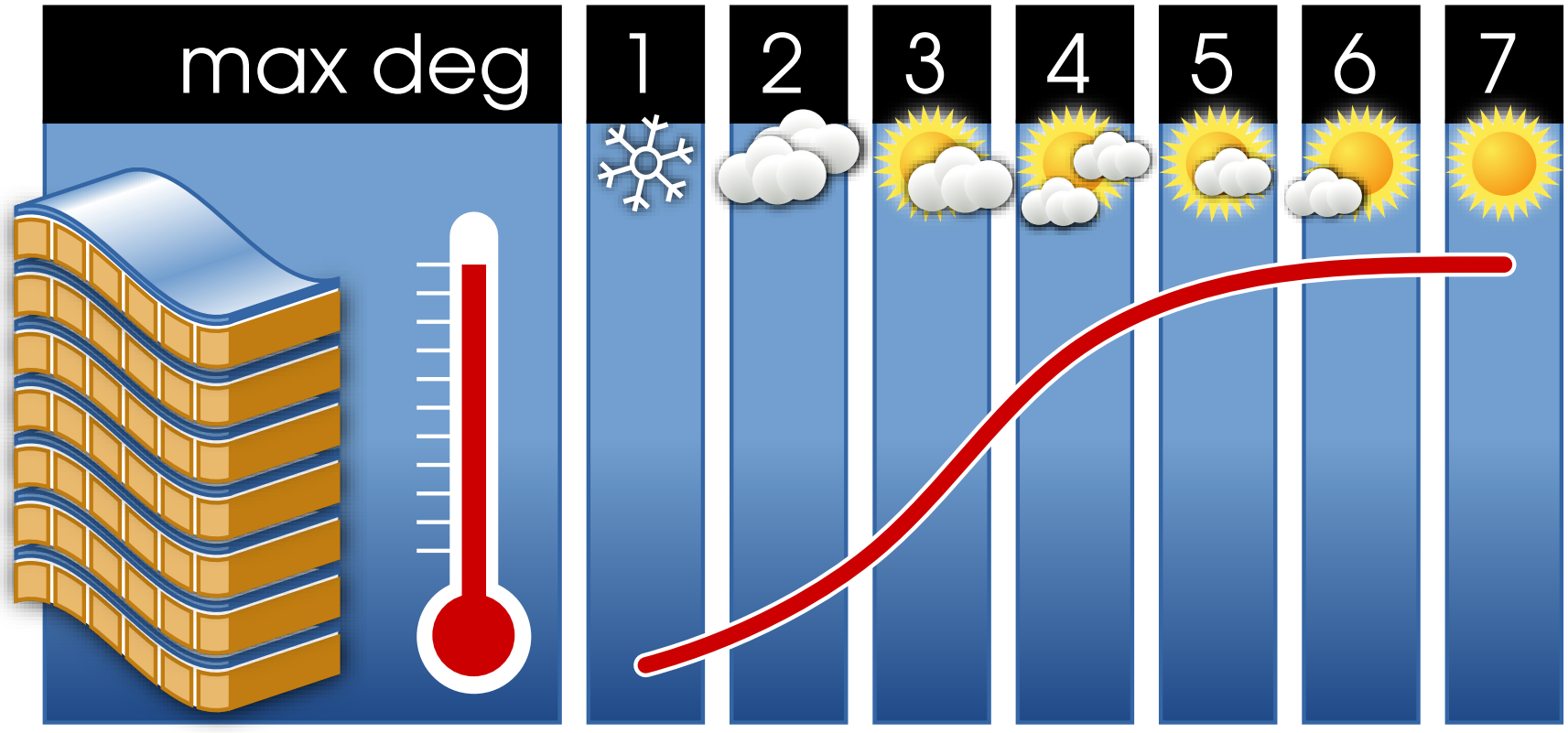


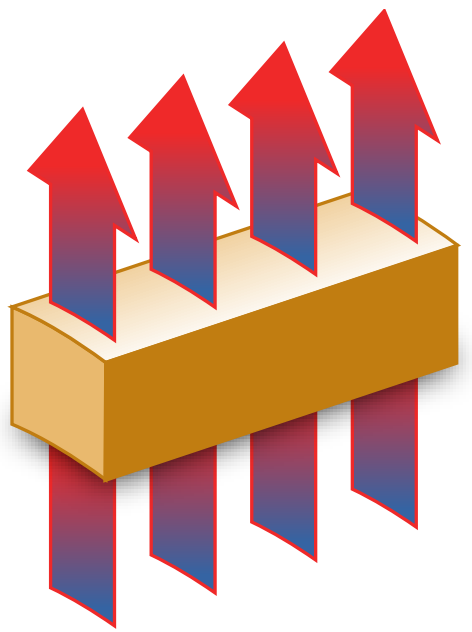
Maximum Degree (Old Bound)



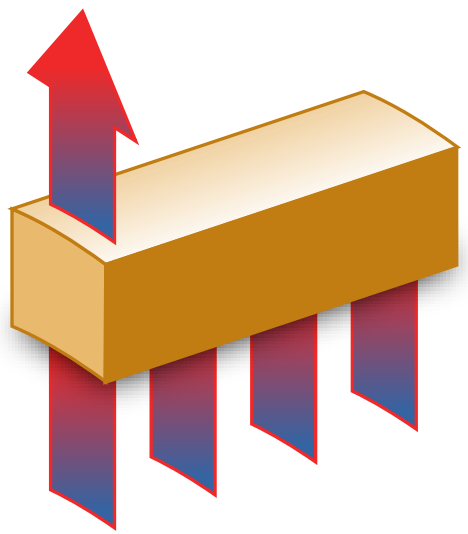
Maximum Degree (New Bound)



Why Does the Growth Slow Down?



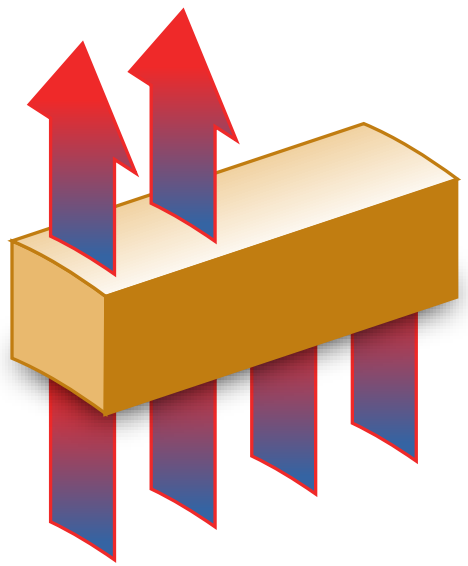
Why Does the Growth Slow Down?



- **Definition of δ_i:**
  maximum degree of any product of i output bits.

i	δ_i
1	

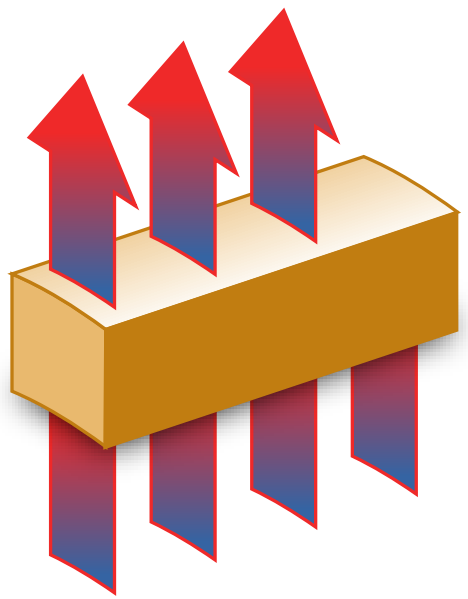
Why Does the Growth Slow Down?



- **Definition of δ_i:** maximum degree of any product of i output bits.

i	δ_i
1	3
2	

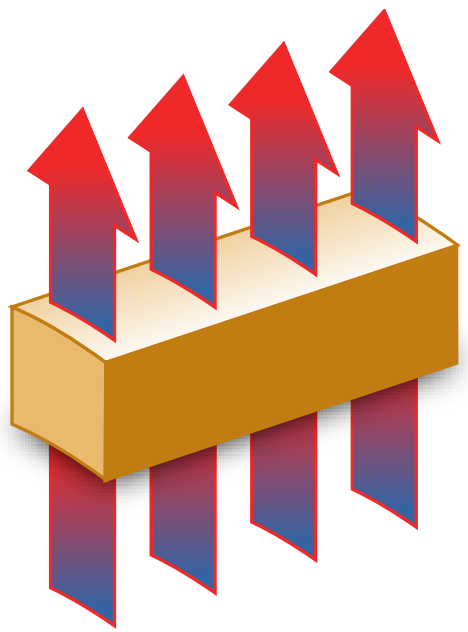
Why Does the Growth Slow Down?



- **Definition of δ_i:** maximum degree of any product of i output bits.

i	δ_i
1	3
2	3
3	

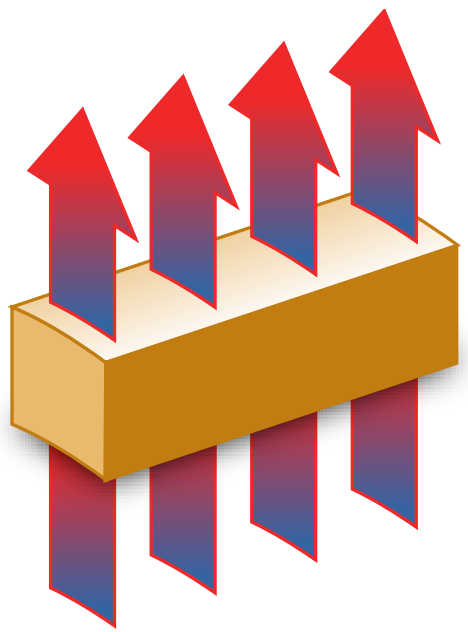
Why Does the Growth Slow Down?



- **Definition of δ_i:** maximum degree of any product of i output bits.

i	δ_i
1	3
2	3
3	3
4	

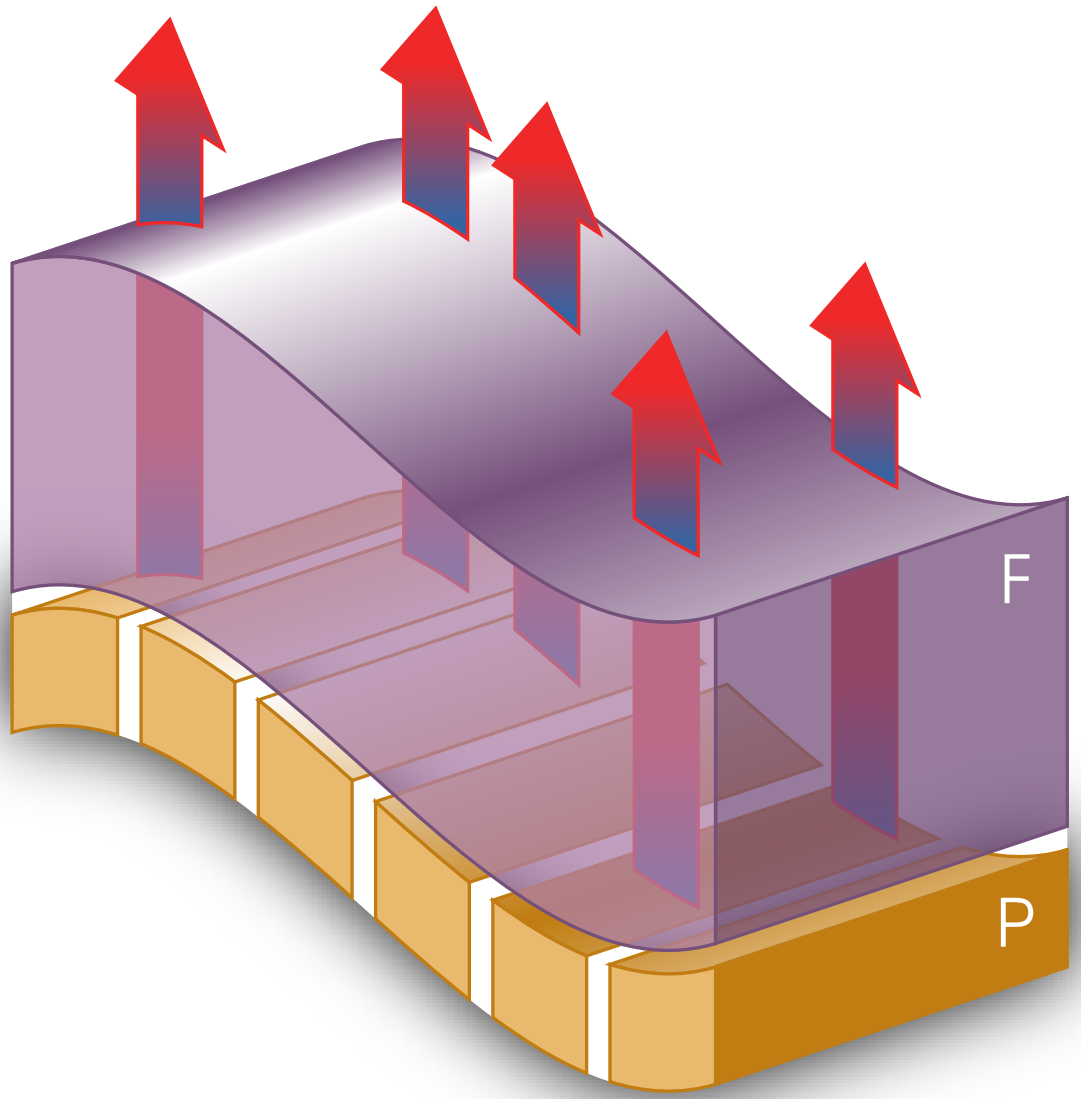
Why Does the Growth Slow Down?



- **Definition of δ_i:** maximum degree of any product of i output bits.

i	δ_i
1	3
2	3
3	3
4	4

Why Does the Growth Slow Down?



The New Bound

Theorem

$$\frac{n - \deg(F)}{n - \deg(F \circ P)} \leq \max_{0<i<n_0} \frac{n_0 - i}{n_0 - \delta_i}.$$

Applications

- **Keccak:** Zero-sum partition for full permutation.
- **Luffa v1:** Higher-order differential for short messages.